

UTEP - Department of Industrial, Manufacturing & Systems Engineering

1. **Course number and name:** MFG 5314 Robotics and Flexible Automation
2. **Credits and contact hours:** 3 SCH – 3 hours of lecture
3. **Instructor's or course coordinator's name:** Dr. Ivan Arturo Renteria Marquez
4. **Text book, title, author, and year:** "Automation, Production Systems, and computer-integrated manufacturing". Mikell Groover. 2019.
 - a. **other supplemental materials:**
 - "Introduction to Robotics: Analysis, Control, Applications". Saeed B. Niku. 2019
 - "Grob's basic electronics". Mitchel Schults. 2016
 - "Digital fundamentals: a systems approach". Thomas L. Floyd. 2013.
 - "Automating with SIMATIC S7-1500: Configuring, Programming and Testing with STEP 7 Professional". Hans Berger. 2014.
 - "Technician's guide to programmable controllers". Terry Borden. 2013
 - "Industrial electronics". James Rehg. 2005.

5. Specific course information

a. brief description of the content of the course (catalog description):

Modern concepts of robotics and flexible automation including power and control mechanisms, flexible material handling systems, programmable controllers, interfacing and end-of-arm tooling.

6. Specific goals for the course

a. specific outcomes of instruction:

- Students will understand the basics of industrial robots, including kinematic of robots, position analysis, and programing of commercial robots.
- Students will understand the basic industrial automation technology and techniques on which the design of modern automation is based. These include: industrial power electronics, electrical motors, pneumatic actuators, motor control and sensors.
- Understand the principle of operation of programmable logic controllers. This includes interfaces, simbology and programming language.

7. Office Location & Hours

E-226E Wednesdays & Friday 1:30 PM-3:00 PM

8. Email address:

iarenteria@utep.edu

9. Topics

Chapter 1. Introduction to production systems (Automation, Production Systems, and computer-integrated manufacturing).

Chapter 2. Kinematics of Robots: Position Analysis (Introduction to Robotics: Analysis, Control, Applications).

Chapter 3. Ohm's Law (Grob's basic electronics).

Chapter 4. Series circuits (Grob's basic electronics).

Chapter 5. Parallel circuits (Grob's basic electronics).

Chapter 6. Introduction to digital systems (Digital fundamentals: a systems approach).

Chapter 7. Logic gates and gate combinations (Digital fundamentals: a systems approach).

Chapter 8. Industrial controllers (Automating with SIMATIC S7-1500: Configuring, Programming and Testing with STEP 7 Professional).

10. Course grading distribution

Homework/Assignments/Quizzes	10%
Exam 1	25%
Exam 2	25%
Final Exam	40%

Quizzes policy: Just students with a valid medical excuse note will be able to present a make up quiz.

11. Grading scheme:

Grades will be distributed based on the following scale:

% of Points Possible	Grade Assigned
≥90	A
≥ 80	B
≥ 70	C
≥ 60	D
< 60	F

The instructor reserves the right to lower the grading scale at the end of the semester. It is expected that each assignment (homeworks, examinations and projects) be professional. The instructor reserves the right to penalize unprofessional responses to any assignment up to including awarding a zero (0) for the assignment.

12. Academic Honesty

During exams and quizzes, you are not allowed to use any form of wi-fi enabled electronic device, including cell phones or other electronic communication devices or methods (calculators, wrist watches, earbuds, etc.).

No electronic version of the book, loose paper print-outs of the book or extra sheets of paper of any kind are allowed unless explicitly mentioned in writing by the instructor. As a part of the zero-tolerance policy, if any proctor sees or hears any electronic device during the exam or if you share your work with someone else, you will be reported to the proper authorities and you may receive a zero on the exam and an F in the class.

If you have a disability that requires the use of an electronic device during exams you must have a letter of accommodation from the Center for Accommodations and Support Services (CASS). This accommodation must be coordinated in advance with the instructor.

During exams, you will not be allowed to leave the examination room until you complete the exam. This includes restroom breaks. Students with disabilities must have a letter of

accommodation and coordinate this in advance with the instructor. Instructors and/or proctors may record and/or use their personal cell phones to document activity during the exam. If you are suspected of scholastic dishonesty you may not be directly confronted about your conduct by the instructor or proctor. You will however, be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) and your exam will not be admissible. Your grade in the class may not be available until OSCCR makes a final ruling, this may adversely impact your ability to enroll in other classes or graduation. If you arrive more than 15 minutes late to an exam, you will not be allowed to enter the examination room.

There will be no makeup exams administered. If you have a university approved excuse, your instructor will have a process for determining how to handle the missing grade outlined in the syllabus. However, no makeup exams will be given. If you miss more than one exam, the instructor may choose to administratively drop you from the class. This may adversely impact a visa and financial aid. Scholastic dishonesty on homework, lab assignments and all other class assignments will be held to the same standards and requirements of academic honesty as quizzes and exams.

13. Harassment Policy

The department has a zero-tolerance policy for harassment. Engagement in any behavior considered harassment will be reported to the proper authorities. In addition to generally understood forms of harassment, the department also treats the following behavior as harassment:

Repeated emails and/or calls regarding subjects about a grade or an administrative decision made. Once a decision has been made or a question answered, a student who continues to ask the same question will be given a warning by the recipient of the email/call.

Grades are NOT negotiable, ever. If you believe a grading mistake has been made, you must follow the process described in the UTEP catalog. Any request for a grade elevation that is NOT based on a mistake is considered harassment and will be reported immediately.

Remaining in an office after the occupant requests you leave is considered harassment and potentially threatening. You will be reported immediately without warning and depending on the severity, may be reported to law enforcement.