SYLLABUS
MENG 4222 – 101: PRODUCTION AND AUTOMATION SYSTEMS
(Required Course)
Spring 2026

COURSE INSTRUCTOR
Dr. Yu Guo (yu.guo@msutexas.edu)
Office: MY 137
Phone: (940) 397-4586
CLASS SCHEDULE: M: 1:00 PM-3.00 PM
OFFICE HRS: M: 11:00 AM-1:00 PM; TR: 12:30 PM-2:00 PM;

ATTENDANCE POLICY
This course will be delivered in "face-to-face" mode: Attendance is mandatory, and it represents a part of your overall grade. Attendance will be ***checked randomly on select lectures***. In-class **Attendance is very important to understand the material.**

D2L (DESIRE 2 LEARN)
D2L platform is used for posting syllabi, some course communication. Normal class attendance is required

CATALOG DESCRIPTION
A study of production systems and automation as used in industry. Course is an overview of principles used in the manufacturing of products and automated equipment that can be used in relation to manufacturing. The class is a theory class, but will have some demonstrations of equipment that will be encountered or is used in industry.

COURSE PRE-REQUISITES
MENG 3203 Applied Fluid Power Design

REQUIRED TEXTBOOK
Automation, Production Systems and Computer-Integrated Manufacturing by Mikell P. Groover Fifth edition

LIST OF TOPICS COVERED*

Production systems, facilities and layouts
Inspection, Quality Control - sampling plans/ control charts, Six Sigma, Process Capability, ISO 9000
MRP (Material Requirements Planning), Just in Time, 5 S, Kaizen, and Lean Manufacturing
Sensors, Actuators, DAC and ADC convertors as used in manufacturing and automation
Industrial Robotics
PLCs
CAD/CAM/CNC/Rapid Prototyping
Automated Inspection/Data Capture: CMMs, Machine Vision, RFID, bar codes
Material Handling/Storage including Automated Guided Vehicles and Automated Storage systems
Computer Integrated Manufacturing (CIM) concept

**Additional material might be covered as the time permits.*

COURSE OBEJCTIVES IN RELATIONSHIP TO ABET STUDENT OUTCOMES

Table 1: Course objectives matched with the ABET student outcomes (1-7)

COURSE OBJECTIVES	1	2	3	4	5	6	7
Student must obtain knowledge of a variety of facilities layouts and production systems	X	X					
Students must be able to create X and R- charts, p-charts and c-charts as used in quality control	X			X			
Student must obtain a knowledge of a variety of sensors and actuators used in Automation and Process control	X	X					
Students must be familiar with the different types of robots used in industry, applications and methods of programming	X	X					
Student must be able to write a simple program for a Kawasaki robot using the AS language	X	X					
Students must understand automated inspection and data capture equipment such as CMMs, Machine Vision, RFID and bar codes	X	X					
Student must develop an understanding of material handling and storage including AGVs, AS/RS systems	X	X					
Student must gain an understanding of the concept of CAD/CAM and CNC machining	X	X					
Student must understand the concepts of MRP, JIT, 5 S, Kaizen and Lean Manufacturing	X	X					

Table 2: Detailed descriptions of the ABET student outcomes (1-7) listed in Table 2.

ABET OUTCOME	DESCRIPTION
1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2	an ability to apply engineering design to produce solutions that meets specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3	an ability to communicate effectively with a range of audiences.
4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

COURSE ORGANIZATION AND STUDENT PERFORMACES ASSESSMENT

- Lecture Format

  This course consists of one 110-minutes sessions per week. The three hours class will be spent mostly explaining and discussing concepts, and solving relevant case problems. Lectures will not be used to communicate the entire textbook course content and thus, students will have to study a set of course paragraphs specified by the instructor on their own to further their understanding. Student participation in class discussions is highly recommended and rewarded.

- Attendance

  Attendance is required for each student. Absences of more than five lectures without proofs of legitimate excuses will result in a failing grade. **For each absences without proofs of acceptable excuses there will be 1 point off from Attendance & Class performance. If you are over 30 minutes late for the class, you are still allowed to sit in the class, but 1 absence will be counted.**

- Student Attitude

  Once class starts, the use of cell phones, reading of newspapers, conducting private discussions, using the computer (unless requested by the instructor), working on anything that is not directly related to the course, and making derogatory remarks about your classmates or instructor will not be accepted and may result in your dismissal from the class. **Each time you are caught will result in 1 point off from Attendance & Class performance. Total grade for Attendance & Class performance is 10 points at beginning and it could become negative.**

- Homework

  Homework will be assigned from a set of chosen chapters. It will be turned in each week, unless specified by the instructor. **Homework must be turned in at the beginning of class. Once class starts, late homework will be graded 80% of the full grade. If you arrived late, you homework will also be counted as late. Late homework will only be accepted until the end of due day.** You will not lose points if you make less than 3 mistakes total in one homework. However, if you copied from solution manual or from your classmates, you will receive zero points.

- Exams

  There will be two regular exams plus one comprehensive exam at the end of the semester. Exam will be closed book, cheat sheet is not allowed. **No smart calculators (any calculator that is able to store files) are allowed.** Each exam is based on the course materials developed between two consecutive exams and possibly lab material if exist, except for the final which is comprehensive. Students are expected to take the exam on the scheduled date and time it is given. However, if for some acceptable reason the student is not able to do so, then he must inform the instructor in advance in writing. The instructor will then decide whether he will be allowed to take a makeup exam, depending on the validity of his excuse. There is only one chance for makeup exam no matter what.

- Evaluation Method

  Your performance will be tested regularly throughout the semester by in-class exams and homework assignments. There will be three exams.

- Course Grade

2	Midterm	20% (together)
1	Final	55%
	Home works	15%
	Attendance & Class performance	10%

***Bonus point in any case will only apply to those with a final grade lower than C.**

GENERAL GUIDELINES

- Plan on spending at least 6 hours outside of class to study the material and to work on homework assignments, and lab experiments. Do not wait until the last day to start working on your report, or prepare for the exam.
- Read the course material before coming to class.
- Utilize the office hours throughout the semester to seek explanations from the instructor.
- Use engineering paper for all homework assignments and exams. Use a systematic approach to solve problems. If a problem involves drawing a graph, use Excel, MATLAB, or any other graphic software tool to draw the graph. In engineering, neatness is a must, not a luxury. Be advised that you will be penalized for lack of neatness.
- You are strongly encouraged to study in group. Time to time a lab partner will be randomly selected for you.

CONFLICT RESOLUTION

a. The student should contact the instructor face to face or via e-mail if there is an issue with the course or the instructor. The faculty and the student will discuss this face to face or via email. Hopefully, a resolution is reached on the issue.

b. The student should notify the faculty via email again if the issue still did not get resolved after the first encounter or communication.

c. The student can then contact the Chair of the McCoy School of Engineering, Dr. Desai, face to face or via email, (raj.desai@msutexas.edu), and discuss this issue. Dr. Desai will discuss the issue at hand with the faculty member. Dr. Desai will discuss the result of this discussion with the student. Hopefully, a resolution is reached on the issue after this.

d. The student should notify the Chair via email if the issue still did not get resolved.

e. The Chair will contact the Dean and try to resolve the conflict. In case the conflict deals with the student grade, she will forward the case to the Grade Appeals Committee if necessary.

GENERAL EDUCATION STATEMENT

Students in this course must demonstrate their competency in oral and written communication through written project tasks assignments. They must also demonstrate their ability to use the English language.

ACADEMIC INTEGRITY POLICY

Scholastic dishonesty will not be tolerated and will be prosecuted to the fullest extent. You are expected to have read and understood the current issue of the student handbook regarding student responsibilities & rights, and the intellectual property policy information about procedures and what constitutes acceptable on-campus behavior. Any form of plagiarism will not be accepted, and will be heavily reprimanded.

DISABILITY SUPPORT SERVICES

Students registered with Disability Support Services should have a letter verifying their disability and the appropriate accommodations.

DISCLAIMER STATEMENT

Information contained in this syllabus, other than grading, late assignments, and attendance policies, may be subject to change with advance notice, as deemed appropriate by the instructor.