



**SYLLABUS**  
**MENG 4222 – 101: PRODUCTION AND AUTOMATION SYSTEMS**  
**(Required Course)**  
**Spring 2024**

**COURSE INSTRUCTOR**

Dr. Jan Brink (jan.brink@msutexas.edu)

Office: McCoy Hall 137

Phone: (940) 397-4589

**CLASS SCHEDULE: M/F: 3-3.50 PM**

**OFFICE HOURS: M: 1-3 ; W/F: 11-12; T: 4-5**

**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 OBJECTIVES 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.

*Prepared by Dr. Jan Brink, Jan 8 2024*

## GRADING SCHEME

The overall grade will be based on the scores earned on the tests, homework assignments, and attendance. The exams account for 90% of the total grade, while homework assignments account for 5%, and the attendance represents the remaining 5%. The contribution of each grade item to the overall score is provided in Table 1.

Table 3: Percentage contribution of each grade item to the overall grade.

Grade Item	Contribution
Test 1	25%
Test 2	25%
Final Exam	25%
Homework	5%
Attendance	20%
<b>TOTAL</b>	<b>100%</b>

**FINAL EXAM IS NOT COMPREHENSIVE: MONDAY, MAY 6<sup>TH</sup> 3.30-5.30 PM**

## CONFLICT RESOLUTION PROCESS

1. In the event of an issue with the course or the instructor, the student should first contact the instructor. The faculty and the student will discuss the issue. Hopefully, a resolution is reached.
2. The student should notify the faculty via email again if the issue still did not get resolved after the first communication.
3. If not resolved, the student could then contact the Chair of the McCoy School of Engineering, Dr. Desai, face to face or via email, ([raj.desai@msutexas.edu](mailto:raj.desai@msutexas.edu)), and discuss the issue.
4. 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 step.
5. The student should notify the Chair via email if the issue still did not get resolved.
6. 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.

## COURSE ORGANIZATION AND ASSESMENT

- **Course Format:** This course consists of three 50-minute sessions each week. Class meetings will contain lecture sessions that cover the relevant topics for that particular class. Not all material can be covered during the class session, hence, expect to spend extra time outside of class to finish reviewing the material.
- **Student Attitude:** Once class starts, the use of cell phones, 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.
- **Midterm Progress Reports:** In order to help the student to keep track of their progress toward course objectives, the instructor for this class will provide a Midterm Progress Report for at-risk students through their Web World account. Midterm grades will not be reported on the students' transcript; nor will they be calculated in the cumulative GPA. They simply give students an idea of where they stand at the

midpoint of the semester. Students earning below a C at the midway point should schedule a meeting with the professor and seek out tutoring.

- **Late Assignments:** Homework assignments must be turned in on the due date, at the due time. Late assignments will *NOT* be accepted
- **Exam Make-up:** Make-up exams will be given only in case of an *emergency* (accompanied by a doctor's report) or a major conflict due to a scheduled *athletic event* or a *conference (proof must be provided)*.
- **General Study Guidelines:** Plan on spending several hours outside of class *each week* to review the material, go through the in-class exercises again, and to work on homework assignments. Do not wait until the last day to start the homework or to prepare for exams. Utilize office hours throughout the semester whenever you need help about the assignments or the course material.
- **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.
- **Disability Support Services:** If you have a documented disability that will impact your work in this class, please contact the [Disability Support Services](#) and the instructor to accommodate your needs.
- **Disclaimer Statement:** Information contained in this syllabus, other than grading policies, may be subject to change with advance notice, as deemed appropriate by the instructor.
- **Campus Carry Rules/Policies:** Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Areas excluded from concealed carry are appropriately marked, in accordance with state law. For more information, please refer to [campus carry rules and policies](#).