



## **IE 431-01E – Manufacturing Support Systems**

COURSE SYLLABUS: FALL 2024

### **INSTRUCTOR INFORMATION**

Instructor:	Sasan Khorasani
Office Location:	AG/ET 219
Office Hours:	Monday-Wednesday 12:15-13,14:15-15:30
Extra online office hours	Tuesday 13-14
Office Phone:	9034688115
Office Fax:	9038865960
University Email Address:	sasan.khorasani@tamuc.edu
Preferred Form of Communication:	Email
Communication Response Time:	48 hours
Course Times:	MW 11am-12:15pm

### **COURSE INFORMATION**

Textbook Required Groover, Mikell P. (2014). Automation, Production Systems, and Computer-Integrated Manufacturing, 5th edition, Pearson, Inc (ISBN- 978-0134605463).  
Software Required • BASIC Stamp Windows Editor version 2.4.2 • AnyLogic Personal Learning Edition • Microsoft Word, Excel, and PowerPoint.

#### **Course Description**

Concepts and principles of automation and automation control, including sensors, actuators, process variable conversion, programmable logic controllers (PLCs), logic controllers, microcontrollers, industrial robotics, NC technology, and flexible manufacturing systems. Prerequisites: Phys. 2426 with a minimum of C.

#### **Student Learning Outcomes**

After completing this course:

1. Explain various reasons for employing automation in a manufacturing environment and describe various applications.
2. Describe the basic function of a sensor and an actuator in an automated system and give examples of both categories.
3. Select an appropriate sensor and/or actuator for a given automated application.

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4. Describe the fundamentals of NC technology.
5. Use a Programmable Logic Controller (PLC) and embedded microcontroller, to perform specified control functions.
6. Describe the basic anatomy and attributes of an industrial robot.
7. Identify and distinguish the different components and interfaces in a Flexible Manufacturing System.
8. Troubleshoot a system and take appropriate action(s) to resolve the issue(s).
9. Design an automated system to meet defined operational specifications.

## **COURSE REQUIREMENTS**

### **Minimal Technical Skills Needed**

1. A scientific calculator for exams.
2. Microsoft Word, Excel, PowerPoint.

### **Instructional Methods**

This course utilizes lectures, assignments to assist students in achieving the course learning outcomes.

### **Student Responsibilities or Tips for Success in the Course**

Students should attend the lectures and deliver the assignment in a timely manner.

## **GRADING**

Final grades in this course will be based on the following scale:

- A = 90%-100%
- B = 80%-89%
- C = 70%-79%
- D = 60%-69%
- F = 59% or Below

Weights of the assessments in the calculation of the final letter grade.

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## Grading rubric

Exam 1:	25%
Exam 2:	25%
Exam 3:	25%
Term project:	25%
TOTAL	100%

## Assessments

This course utilizes lectures and assignments to assist students in achieving the course learning outcomes. The assessment criteria for the stated student learning outcomes will include a term project, assignments, and exams.

## TECHNOLOGY REQUIREMENTS

### LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:

<https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>

LMS Browser Support:

[https://documentation.brightspace.com/EN/brightspace/requirements/all/browser\\_support.htm](https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm)

YouSeeU Virtual Classroom Requirements:

<https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements>

## ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or [helpdesk@tamuc.edu](mailto:helpdesk@tamuc.edu).

**Note:** Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary

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use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

## **COMMUNICATION AND SUPPORT**

If you have any questions or are having difficulties with the course material, please contact your instructor.

### **Technical Support**

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

<https://community.brightspace.com/support/s/contactsupport>

### **Interaction with Instructor Statement**

The instructor will response to your questions on D2L tools within 24 hours. For urgent questions, and for questions that are not answered within 24 hours, please prefer e-mail correspondence.

## **COURSE AND UNIVERSITY PROCEDURES/POLICIES**

### **Course Specific Procedures/Policies**

One day late assignment is accepted with a 15% grade deduction; after this, no assignment will be accepted.

Assignments and labs will be given to support the instructional material (homework assignment). Students will have an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. Students will have an ability to communicate effectively.

There will be three exams. Students will apply statistics to solve applied engineering problems. Exams will be used to assess a student's knowledge and skills related to applied statistics concepts.

The student project is devised to make students utilize their knowledge to solve real world problems. The types of projects will be left up to the student teams. The final report should be comprehensive, should describe methods used, and should show and illustrate the improvements and the final solution. A detail written procedure will be provided at the time of team member formation.

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## **Syllabus Change Policy**

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

## **University Specific Procedures**

### **Student Conduct**

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](#).

<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:

<https://www.britannica.com/topic/netiquette>

### **TAMUC Attendance**

For more information about the attendance policy please visit the [Attendance](#) webpage and [Procedure 13.99.99.R0.01](#).

<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

### **Academic Integrity**

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03](#)  
[Undergraduate Student Academic Dishonesty Form](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/documents/13.99.99.R0.03UndergraduateStudentAcademicDishonestyForm.pdf>

[Graduate Student Academic Dishonesty Form](#)

<http://www.tamuc.edu/academics/graduateschool/faculty/GraduateStudentAcademicDishonestyFormold.pdf>

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<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

## **Students with Disabilities-- ADA Statement**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

### **Office of Student Disability Resources and Services**

Texas A&M University-Commerce

Velma K. Waters Library Rm 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: [studentdisabilityservices@tamuc.edu](mailto:studentdisabilityservices@tamuc.edu)

Website: [Office of Student Disability Resources and Services](#)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

## **Nondiscrimination Notice**

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

## **Campus Concealed Carry Statement**

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](#) document and/or consult your event organizer.

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Web url:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

## Department or Accrediting Agency Required Content

### COURSE OUTLINE / CALENDAR

Week	Date	Topics	Assignment
1	8/26	Introduction to Manufacturing Support Systems and Computer Integrated Manufacturing	Chs. 1
	8/28	Reading & Quiz 1	Q1
2	9/2	Labor Day	
	9/4	Manufacturing Operations	Ch.2
3	9/9	Manufacturing Metrics and Economics	CH.3
	9/11	Quiz 2	Q1
4	9/16	Manufacturing Metrics and Economics	CH.3
	9/18	Manufacturing Metrics and Economics	CH.3
5	9/23	Exam review	
	9/25	Exam 1	
6	9/30	Single-Station Manufacturing Cells	Ch. 14
	10/2	Single-Station Manufacturing Cells & Video and Quiz	Ch. 14
7	10/7	Single-Model Assembly Lines	Ch. 15
	10/9	Flexible Manufacturing Cells and Systems	Ch. 19
8	10/14	Exam review	
	10/16	Exam-2	
9	10/21	Automation and Control Technologies	Chs. 4, 5, 6
	10/23	Automation and Control Technologies & Video and Quiz	Chs. 4, 5, 6
10	10/28	Industrial Robotics	Ch. 8
	10/30	Industrial Robotics & Video and Quiz	Ch. 8

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11	11/4	Computer Numerical Control	Ch.7
	11/6	Computer Numerical Control & Video and Quiz	Ch.7
12	11/11	Exam Review	
	11/13	Exam 3	
13	11/18	Term Project	
	11/20	Term Project	
14	11/25	Term Project	
	11/27	Thanksgiving break (University closed)	
15	12/2	Presentation	
	12/4	Presentation	
16	12/7	<b>Final Exam(Optional)</b>	

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