The University of Jordan
School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Automatic Control	0994411	Fall

2025 Course Catalog Description

Study of continuous-time systems, classical and modern system design methods, transfer functions models, state space, dynamics of linear systems, and frequency domain analysis and design techniques. Introduction of controllability and observability, and full-state pole placement controller design

Instructors

Name	E-mail	Section	Office Hours	Lecture Time

Text Books

	Text book 1	Text book 2
Title	**Modern Control Systems**	
Author(s)	R. C. Dorf and R. H. Bishop	
Publisher, Year, Edition	12th Edition, Prentice Hall, 2011	

References

Books	1. Feedback Control of Dynamic Systems, G.F. Franklin, J.D., Powell and A. Emami-Naeini, 6th Edition. 2. Control Systems Engineering Nise, 2nd Edition. 3. Modern Control Engineering, K. Ogata, 4th Edition. 4. Automatic Control Systems, Farid Golnaraghi and Benjamin, C. K, 9th Edition. 5. Schaum's outline of theory and problems of feedback and control systems, J. J. Distefano, A. R., Stubberud and W. J. Williams, 2nd Edition.
Journals	
Internet links	

Prerequisites

Prerequisites by topic	
Prerequisites by course	
Co-requisites by course	Sound and Mechanical Vibrations 0994311
Prerequisite for	Instrumentation

Topics Covered

Week	Topics	Chapter in Text
1	Introduction to Control Systems	
2	Mathematical Models of Systems	
3	State Variable Models	
4	Feedback Control System Characteristics	
5-7	The Performance of Feedback Control Systems	

8	The Stability of Linear Feedback Systems	
9-10	The Root Locus Method	
11-12	Frequency Response Methods	
13	Stability in the Frequency Domain	
14	The Design of Feedback Control Systems	
15	The Design of State Variable Feedback System	

Mapping of Course Outcomes to ABET Student Outcomes	
SOs	**Course Outcomes**
1,2	Learn the purposes, advantages and disadvantages, terminologies, and configurations of feedback control systems. Give students knowledge and ability of determining the stability of a system for both the classical and modern control. Develop a basic feel for the time domain and frequency domain responses for simple systems. Represent various types of dynamic systems, including transfer functions, block diagrams, and state- space. To learn how to design a controller to meet time-domain specifications.

Evaluation		
Assessment Tools	**Expected Due Date**	**Weight**
First Exam		25
Second Exam		25
Final Exam		50

Contribution of Course to Meet the Professional Components

This course is one of the first opportunities for engineering students to encounter the fundamental principles of design problem solving. It is an important prerequisite course for number of designs related-courses, which occur later in the programs of engineering students.

Relationship to Student Outcomes

SOs	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Availability	X	X					

Relationship to Aeronautical Engineering Program Objectives (AEPOs)

AEPO1	**AEPO2**	**AEPO3**	**AEPO4**	**AEPO5**

ABET Student Outcomes (SOs)	
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 meet 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 judgments, 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
Updated by ABET Committee, 2025	