The University of Jordan
School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Aircraft Stability and Control	0994412	Spring

2025 Course Catalog Description

Introduction to stability and control of flight vehicles. Flight dynamic equations of unsteady motion. Inertial and aerodynamic coupling. Stability and control of longitudinal and lateral-directional motions. Dynamic stability and control.

Instructors

Name	E-mail	Section	Office Hours	Lecture Time

Text Books

	Text book 1	Text book 2
Title	Flight Stability & Automatic Control	
Author(s)	Robert Nelson (1998)	
Publisher, Year, Edition	2nd Edition, McGraw Hill	

References

Books	1. Dynamics of Flight: Stability & Control, Etkin, B. and Reid, L. (1998), 3rd Edition, Wiley. 2. Introduction to Aircraft Flight Dynamics, Schmidt, L.V. (1998), 1st Edition. 3. Airplane Flight Dynamics and Automatic Flight Control, Part I, Roskam, J. (2007), 1st Edition, DAR Corp. 4. Flight Dynamics Principles, Cook, M.V. (2007), 2nd Edition, Elsevier.
Journals	
Internet links	

Prerequisites

Prerequisites by topic	
Prerequisites by course	Aerodynamics I 0994363 + Aircraft Structure I 0994481
Co-requisites by course	
Prerequisite for	Aircraft Design Aircraft Navigation

Topics Covered

Week	Topics	Chapter in Text
1	Introduction, Atmospheric Properties, and Aerodynamics	
2-5	Static stability and control	
6-9	Flight dynamics	
10-12	Flight analysis	
13-15	Flight control	

Mapping of Course Outcomes to ABET Student Outcomes

SOs	Course Outcomes
2,4	To learn how to determine static longitudinal, directional & lateral stability and control derivatives, and criteria for a stable airplane.
	To develop an ability to size the control surfaces and to determine control effectiveness of power.
	To learn how to determine the control stick forces and hinge moments.
	To learn how to determine longitudinal and lateral motion derivatives.
	To introduce the concept of dynamic stability & control and flying qualities.

Evaluation

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

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