The University of Jordan
School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Aircraft Design	0994531	Summer

2025 Course Catalog Description

Conceptual design of a modern airplane to satisfy a given set of requirements. Estimation of size, selection of configuration, weight and balance, and performance of airplane. Satisfaction of stability, control, and handling quality requirements.

Instructors

Name	E-mail	Section	Office Hours	Lecture Time

Text Books

	Text book 1	Text book 2
Title	Aircraft Design: A Conceptual Approach	
Author(s)	Daniel P. Raymer	
Publisher, Year, Edition	5th Edition	

References

Books	1. Introduction to Aircraft Performance, Selection and design, Hale, Francis J, 1st Edition Fundamentals of Airplane Flight 2. Aircraft Performance and Design, John D. Anderson, Jr., 1st Edition. 3. Introduction to aircraft design, Fielding, John P, 1st Edition. 4. Aircraft design projects for engineering students Jenkinson, 1st Edition. 5. Airplane Design I – VIII, Jan Roskam, 2nd Edition.
Journals	
Internet links	

Prerequisites

Prerequisites by topic	-
Prerequisites by course	Aircraft Stability and Control 0994412
Co-requisites by course	-
Prerequisite for	-

Topics Covered

Week	Topics	Chapter in Text
1	Overview of aircraft design process	
4-2	Aircraft sizing from a conceptual sketch	
7-5	Geometry selection of airfoil and major aircraft components	
9-8	Selection of critical aircraft performance parameters	
12-10	Initial sizing of the airplane	
14-13	Configuration layout and special design considerations	
16-15	Layout of the crew station and passengers/payload compartments	

Mapping of Course Outcomes to ABET Student Outcomes	
SOs	**Course Outcomes**
2,4	Classify the different phases of aircraft design. Know the key concepts required to develop a credible initial lay-out for a conceptually designed aircraft. Realize and comprehend the main consideration for aircraft conceptual design. Analyze the mission segments and maneuvers of the aircraft and select the critical performance parameters for the intended design. Perform conceptual design for an aircraft based on historical data and a conceptual sketch. Select initial geometries for the major aircraft components based on the understanding of the aircraft mission and requirements. Design an aircraft based on the performance parameters. Comply with the regulations and the design considerations of the internal compartments of an aircraft.

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