The University of Jordan
School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Propulsion	0994443	Summer

2025 Course Catalog Description

An integrated approach to the application of engineering principles to propulsion systems, Topics include: turboprops, turbojets, turbofans, turbo shaft, ramjets, scramjets and rocket engines, beside intakes, compressors, fans, combustors, turbines and propelling nozzles

Instructors

Name	E-mail	Section	Office Hours	Lecture Time

Text Books

	Text book 1	Text book 2
Title	Fundamentals of Jet Propulsion with Applications.	
Author(s)	Ronald D. Flack	
Publisher, Year, Edition	1st Edition, Cambridge University Press.	

References

Books	1. Gas Turbine Theory Cohen, H., Rogers, G.F.C. and Saravanamutloo, H.I.H., 5th Edition. Fundamentals of Airplane Flight. 2. Elements of Gas Turbine, Propulsion Mattingly, J.D, McGraw, Hill, New York, 1st Edition.
Journals	
Internet links	

Prerequisites

Prerequisites by topic	-
Prerequisites by course	Aerodynamics I 0994363
Co-requisites by course	-
Prerequisite for	-

Topics Covered

Week	Topics	Chapter in Text
1	Introduction	
5-2	Ideal Cycle Analysis	
7-6	Non-Ideal Cycle Analysis	
9-8	Diffusers	
11-10	Nozzles	
14-12	Axial Flow Compressors, Turbines and Fans	
16-15	Combustors, Afterburners	

Mapping of Course Outcomes to ABET Student Outcomes

SOs	Course Outcomes
2,7	Analyze thermodynamics of an aircraft jet engine and calculate the engine performance measures, such as thrust and specific fuel consumption in terms of design and operating conditions. Analyze performance of standalone inlets (diffusers), nozzles, Combustors and understand the factors that limit their performance. Analyze the operating characteristics of compressors and turbines in terms of given blade geometry, blade angles and deflections, and the shaft angular speed. Classify propelling engines according to methods of propulsion and usage, and recognize the components of each types and its function. Compare the performance of each engine type as a function of operating condition and engine parameters, such as maximum engine temperature, pressure ratio, and flight Mach number.

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