The University of Jordan
School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Computational Fluid Dynamics	0994505	Fall or Spring

2025 Course Catalog Description

Introduction to computational fluid dynamics and heat transfer using the finite-volume method. Extensive code development. Application of a commercial CFD solver to a problem of interest.

Instructors

Name	E-mail	Section	Office Hours	Lecture Time

Text Books

	Text book 1	Text book 2
Title	An Introduction to Computational Fluid Dynamics: The finite volume method.	
Author(s)	Versteeg, H. K. and Malalasekkera, W	
Publisher, Year, Edition	1st Edition, McGraw-Hill's.	

References

Books	1. Numerical heat transfers and fluid flow, Suhas Patankar, 1st Edition, McGraw-Hill's. 2. Computational Fluid Dynamics, Anderson, John D., 1st Edition, Pearson
Journals	
Internet links	

Prerequisites

Prerequisites by topic	
Prerequisites by course	Heat Transfer 0904441
Co-requisites by course	
Prerequisite for	

Topics Covered

Lecture	Topics	Chapter in Text
1	Introduction, Navier Stokes Equations	
4-2	Introduction to finite difference and finite volume method	
16-5	Introduction to commercial CFD software ANYSYS FLUENT	

Mapping of Course Outcomes to ABET Student Outcomes

SOs	Course Outcomes
1	To develop an understanding for: the major approaches and methodologies used in CFD. Increase skills in: implementing and using basic CFD methods, computer use and programming, debugging.

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						

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