Jordan University of Science and Technology
Faculty of Engineering
Civil Engineering Department

CE763 Advanced Foundation Engineering - JNQF Level: 9
First Semester 2024-2025

Course Catalog
3 Credit Hours. This course covers fundamental and advanced concepts in foundation engineering, with an emphasis on site investigation and foundation design. Topics include methods for site investigation, analysis of shallow foundations, and calculation of bearing capacity and settlement. The course also explores beams on elastic foundations and provides an in-depth look at pile foundation design under static loading. Additional subjects include the application of wave equation theory, the behavior of piles under uplift and lateral loading, and the use of model piles in design and testing. Through this curriculum, students will develop the skills needed to analyze, design, and assess various types of foundation systems in geotechnical engineering.

Teaching Method: Blended

Text Book	
Title	Principles of Foundation Engineering
Author(s)	B.M. Das
Edition	8th Edition
Short Name	1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
1	Geotechnical Engineering Circular No. 6 ? Shallow Foundations,	FHWA	1st Edition	
3	Foundation Engineering Handbook	Hsai-Yang Fang	2nd Edition	(1991)

Instructor	
Name	**Dr. Samer Rababah**

Office Location	C2 L-1
Office Hours	Sun : 08:30 - 10:00 Mon : 10:00 - 11:30 Mon : 13:00 - 14:00 Tue : 08:30 - 10:00 Wed : 10:00 - 11:30
Email	srrababah@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Tue : 10:30 - 12:30 Room: قاعة الندوات

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction to Foundation Engineering	
Weeks 2, 3	Site Investigation Techniques	From **1**
Weeks 4, 5	Bearing Capacity of Foundations	From **1**
Weeks 6, 7	Settlement Analysis of Foundations	From **1**
Weeks 8, 9	Beams on Elastic Foundations	From **3**
Weeks 10, 11	Pile Foundations	From **1**, From **1**, From **3**
Week 12	Wave Equation Theory	From **3**
Week 13	Piles Subjected to Uplift Loading	From **3**
Weeks 14, 15	Laterally Loaded Piles	From **3**
Week 16	Model Piles and Experimental Techniques	From **3**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	**Course Outcome Weight (Out of 100%)**	**Assessment method**
To be able to identify Subsurface Exploration Techniques, including the need for subsurface exploration and the planning and implementation of various site investigation methods, such as drilling, sampling, and in-situ testing. [1L9K2]	15%	
To be able to analyze and calculate the bearing capacity of shallow foundations, along with evaluating potential settlement using established methodologies. [1L9S3]	25%	
To be able to apply theoretical concepts to analyze the behavior of beams on elastic foundations, determining deflections and reactions under various loading conditions. [1L9S3]	15%	

To be able to design of pile foundations that effectively support static loads, employing appropriate engineering principles and industry standards. [1L9S3]	20%	
To be able to use wave equation theory to assess the installation and dynamic performance of piles, predicting their response to applied loads. [1L9S3]	10%	
To be able to evaluate the performance of piles subjected to uplift and lateral loading, designing appropriate measures to ensure structural integrity. [1L9S3]	15%	

Relationship to Program Student Outcomes (Out of 100%)											
PI-1a	PI-2a	PI-2b	PI-2c	PI-2d	PI-3a	PI-4a	PI-4b	PI-5a	PI-6a	PI-6b	PI-7a

Relationship to NQF Outcomes (Out of 100%)	
L9K2	L9S3
15	85

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