

CE 484 Deep Foundations

Credit and Contact hours	3 / 3 (Lectures), 1 (Tutorials), 0 (Laboratory)
Instructors	Dr. Ahmed Alnuaim (2A63)
Textbook(s) and Other Required Material	<ol style="list-style-type: none"> 1. Principle of Foundation Engineering by Braja M Das, Latest Edition. 2. Foundation Engineering by Bowels. 3. Saudi Building Code for soils and foundations.
SPECIFIC COURSE INFORMATION	
Course Description	Analysis and design different type of deep foundations in different soil and rock conditions.
Prerequisites or Co-requisites	Prerequisites: CE 481 and Co-requisite: CE 483 Prerequisite by Topics: <ol style="list-style-type: none"> 1. Recognize the behavior of different soil type. 2. Aware of the different in-situ soil testing and their applications. 3. Understanding the concepts of shear strength and consolidation of the soil. 4. Ability to evaluate the bearing capacity of deep foundation in soil and rock.
Required, Elective, or Selected Elective	Elective Course, Ninth or Tenth Level
SPECIFIC GOALS FOR THE COURSE	
Course Learning Outcomes	Students completing this course successfully will be able to CLO 1 - Identify the methods of site investigations and determine the site characteristics. CLO 2 - Recognize the different types of deep foundations. CLO 3 – Estimate bearing capacity for different types of single and group piles for different soils and rocks. CLO 4 – Predict the settlement of the deep foundations. CLO 5 – Ability to design for laterally loaded pile.

	<p>CLO 6 – Ability to design sheet piles walls.</p> <p>CLO 7 - Comply with General overview of Saudi Building Code for soils and foundations</p>						
Student Outcomes	<p>SO 1 - An ability to apply knowledge of mathematics, science, and engineering</p> <p>SO 3 - An ability to design a system, component, or process to meet desired needs with realistic constraints such as economic, environmental, social, ethical, health and safety, and sustainability</p> <p>SO 5 - An ability to identify, formulate, and solve engineering problems including the ability to evaluate and synthesize information and develop alternative solutions</p> <p>SO 11 - An ability to use the techniques, skills and modern engineering tools necessary to civil engineering practice</p>						
Topics Covered	<ol style="list-style-type: none"> 1. Introduction and site Investigations (3 hours). 2. Types of deep foundation (3 hours). 3. Load bearing capacity of piles (9 hours). 4. Pile load test (3 hours). 5. Pile group capacity and settlement: (6 hours). 6. Laterally loaded pile (3 hours). 7. Piles resting on rock (6 hours). 8. Driven shafts: drilled pier, and bored pile (6 hours). 9. Sheet pile walls (3 hours). 						
Grading System	<table> <tr> <td>Mid-Term Exams</td> <td>40%</td> </tr> <tr> <td>Quizzes and Homework</td> <td>10%</td> </tr> <tr> <td>Final Exam</td> <td>50%</td> </tr> </table>	Mid-Term Exams	40%	Quizzes and Homework	10%	Final Exam	50%
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