

College of Engineering

Department of Civil Engineering



CE 484 Deep Foundations

Credit and Contact hours	3 / 3 (Lectures), 1 (Tutorials), 0 (Laboratory)	
Required, or Elective	Elective for a BSCE degree	
Course Description	General concepts. Types of deep foundation. Bearing capacity of single piles. Bearing capacity of group piles. Settlement of piles. Laterally loaded piles. Excavation and bracing. Sheet piling. Drilled piers. Caisson foundations.	
Prerequisites or Co-requisites	Prerequisites for CE 481 (Geotechnical Engineering-II), CE 470 (Reinforced Concrete Design-2), and Co-requisites for CE 483 (Foundation Engineering)	
Course Learning Outcomes	Students completing this course successfully will be able to	
	Course Learning Outcomes	<i>Related Student Outcomes (SO)</i>
	CLO1. Assess the soil properties by implementing different methods of site investigations	SO4
	CLO2. Determine the suitable types of deep foundations, and method of constructions for different types of soils and site conditions	SO2
	CLO3. Evaluate the bearing capacity of different types of single and group piles for different types of soils and site conditions.	SO4
	CLO4. Evaluate the settlement of different types of deep foundations for different soil and site conditions	SO4
	CLO5. Design axially loaded, laterally loaded piles and sheet piles walls to support real structures with the consideration of safety and economic aspects.(through a project)	SO2
Student Outcomes related to this Course	SO4. 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. [ABET 4]	
	SO2. 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. [ABET 2]	

Topics Covered	List of Topics		Related CLOs
	1. Introduction and site investigations		CLO1
	2. Types of deep foundation		CLO2
	3. Load bearing capacity of piles		CLO3
	4. Settlement of piles		CLO4
	5. Pile load test		CLO3
	6. Pile group capacity		CLO3
	7. Pile group settlement		CLO4
	8. Laterally loaded pile		CLO5
	9. Piles resting on rock		CLO3
	10. Bearing capacity of drilled shafts: drilled pier, and bored pile		CLO3
	11. Settlement of drilled shafts: drilled pier, and bored pile		CLO4
	12. Lateral capacity of drilled shafts: drilled pier, and bored pile		CLO5
	13. Sheet pile walls		CLO5
Textbook(s) and Other Required Material	1. Principle of Foundation Engineering by Braja M Das, Latest Edition. 2. Bowles, J. Foundation Analysis and Design, 5th Edition, McGraw Hill, 1996. 3. Day, R.W. Foundation Engineering Handbook, 1st Edition, McGraw Hill, 2005 4. Manual of Canadian foundation design, 2007		
Grading System	Assignments	10%	
	Mid-term exams	40%	
	Quizzes	10%	
	Final Exam	40%	
Instructors	Dr. Ahmed Alnuaim (Room 2A42), email; Alnuaim@ksu.edu.sa		
Date of Review	September 2020		