

Foundation Engineering and Design

Course Name	Course type (credit/hours)	Elective course(3/3)	Course code	E070
	Target students Division/major/grade	Civil System Engineering/Junior	Opening semester	2021 2ND SEMESTER
	Class time and classroom	Mon C(Pa1310)Wed C(Pa1310)	English Grade	A(100%English)
Reference to this course	Prerequisite courses	-		
	Related basic courses	Soil mechanics. Soil Mechanical Experiment		
	Recommended concurrent courses			
	Related advanced courses	Ground Stabilization Analysis		

Instructor	Name (title/division)		Ilhan Chang(Associate Professor , Civil System Engineering)		
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	Office hours	Tue 09:30-10:30		Homepage address	
Teaching Assistant	Name (title/division)				
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1. Introduction

Foundation is an essential construction member between the overburden structure and underlying ground, which promotes the revelation of ground resistance and transfers the overburden load into the ground through material and geometric dissipation. Foundation Engineering mainly aims to design and assess the stability of practical foundation structures using comprehensive understanding on soil mechanics and geotechnical engineering theories. Thus, this course will cover following subjects for students active learning.

- The importance of reliable ground investigation (survey) for safe and economic feasible civil structure design.
- Ground bearing capacity theories and Shallow foundation design
- Behavior of deep foundations and Pile foundation design
- Behavior of group piles and design
- Foundation on problematic soils
- Ground improvement practices to enhance the ground bearing capacity

2. Course Objectives

Course Learning Outcomes (CLO)

CLO 1: Based on reliable ground investigation results, it is trained to present foundation structure types suitable for field conditions.

CLO 2: It is trained to present key elements of shallow foundation design and alternatives to improving stability.

CLO 3: It is trained to understand the characteristics of stress behavior (end bearing capacity, skin friction force) of deep (pile) foundation structures and to understand the main points of deep foundation construction.

CLO 4: It shall be educated to understand the types of special ground and various ground reinforcement methods for improvement of the relevant ground and to present on-site application methods.

3. Class types and activities

To enhance students understanding and practical applicability on real foundation design and ground improvement practices, state-of-the-art knowledge on ground investigation, shallow foundations, deep foundations, and ground improvement methods will be delivered by main lectures.

In addition, to understand current developments in foundation types and ground improvement methods, team-base term projects will be assigned for students self-learning, reporting, and discussion. All assessment items (assignments, project reports, mid-term and final exams) are asked to be prepared in English, as well as project presentations and discussions will be also conducted with English to improve the capacity of our future global engineers.

All lectures will be delivered via in class mode, but can vary if we face higher level of social distancing (COVID-19 restrictions) situations.

When in class lectures are restricted, all lectures will be delivered through an online platform (Zoom or Blackboard Collaborate).

All students must turn on their camera to validate her/his attendance (No exception). Joined students with turned-off cameras will be regarded as absent.

4. Teaching Method

lecture

discussion and debate

team project(presentation and case studies)

experiments(role-playing,etc)

designing and production

on-site learning(on-site training)

others

5. Support Systems in Use

AjouBb

automatic recording system

web-based assignment

cyber lecture

online content

class behavior analyzating system

others

6. Teaching Tools

PBL(Problem Based Learning)

CBL(Case Based Learning)

TBL(Team Based Learning)

UR(Undergraduate Research)

FL(Flipped Learning)

DSAL(Data Science Active Learning)

others

7. Knowledge and ability required for taking this course

soil mechanics, material mechanics, fluid mechanics, hydraulics

8. Method of Evaluation

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance	32	10%	In class attendance / For online lectures, students are asked to turn-on their cameras to validate her/his participation.
midterm exam	1	20%	Scheduled in Week 8
final exam	1	30%	Scheduled in Week 16
quiz			
presentation	1	15%	Term project presentation (Scheduled in Week 15)
discussion			
homework	2	15%	Homework Assignments – 2 times (7% + 8%)
etc	1	10%	Term project report (Due Week 14)
study hours			

9. Textbook and supplementary material

Main/Sub	Title (Web-site)	Writer	Publisher	Publication year
Main	Principles of Foundation Engineering. 8th Edition.	Braja M. Das	Cengage Learning	2016
Sub	Foundation Engineering	이상덕(Sang Duk Lee)	씨아이알	2014

10. Class system and Class shedule

In order to learn background theory and application methods for each foundation structure, classes are conducted in the following order.

1. Foundation theoretical lecture
2. Lecture on the Mechanical Perspective and Design Focus of Foundation Structures
3. Lecture on the Principles and Design of Ground Reinforcement Method for Improving Ground Stability
4. Analysis, presentation and discussion of the latest technology trends through group projects

< Class Schedule >

* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
1	Review on Soil Mechanics (I)	E	Ilhan Chang	Lecture		
2	Review on Soil Mechanics (II)	E	Ilhan Chang	Lecture		
3	지반의 조사 및 현장시험 (Investigation of the ground and on-site testing)	E	Ilhan Chang	Lecture		
4	Introduction to Foundation Engineering	E	Ilhan Chang	Lecture Design Practice		
5	지반지지력(Ground bearing capacity)	E	Ilhan Chang	Lecture		
6	얕은기초 (Shallow foundations) I	E	Ilhan Chang	Lecture	Homework assignment 1	
7	얕은기초 (Shallow foundations) II	E	Ilhan Chang	Lecture Design Practice		
8	중간고사(Midterm exam)	E	Ilhan Chang	exam	Midterm exam	
9	깊은기초(Deep foundation)	E	Ilhan Chang	Lecture		
10	말뚝기초(Pile foundations) I	E	Ilhan Chang	Lecture		
11	말뚝기초(Pile foundations) II	E	Ilhan Chang	Lecture		
12	현장타설 기초(Cast in-situ piles)	E	Ilhan Chang	Lecture	Homework assignment 2	
13	특수지반에서의 기초형식 (Foundations in problematic ground)	E	Ilhan Chang	Lecture		
14	기초지반 보강-다짐 및 치환 (Ground improvement)	E	Ilhan Chang	Lecture	Term project report submission	
15	과제 발표 및 토론(Term project presentation)	E	Ilhan Chang	Presentation	Term project presentation	
16	기말고사(Final exam)	E	Ilhan Chang	exam	Final exam	

11. Other items of notification