

Foundation Engineering and Design

Course Name	Course type (credit/hours)	Elective course(3/3)		Course code	E057
	Target students Division/major/grade	Civil System Engineering/Junior		Opening semester	2020 2ND SEMESTER
	Class time and classroom	Tue F(Pal310)Thu E(Pal310)		English Grade	A(100%English)
Reference to this course	Prerequisite courses	-			
	Related basic courses	토질역학			
	Recommended concurrent courses				
	Related advanced courses	지반안정해석			
Instructor	Name (title/division)		Ilhan Chang(Associate Professor, Civil System Engineering)		
	Office Room Number		Office phone Number		e-mail
	Office hours	수 15:00~18:00		Homepage address	
Teaching Assistant	Name (title/division)				
	Office Room Number		Office phone Number	2509	e-mail

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 including compaction, replacement, dewatering and drainage, injection (grouting), and deep mixing

2. Course Objectives

Course Learning Outcomes (CLO)

CLO 1: 신뢰성 있는 지반조사 결과를 토대로 현장 조건에 적합한 기초구조물 형식을 제시할 수 있도록 교육한다

CLO 2: 얕은기초 구조물 설계의 핵심 요소 및 안정성 향상을 위한 대안들을 제시할 수 있도록 교육한다

CLO 3: 깊은(말뚝)기초 구조물의 응력거동(선단지지력, 측면마찰력) 특성을 이해하고, 깊은기초 시공의 주요 주안점들을 이해할 수 있도록 교육한다.

CLO 4: 특수지반의 유형과 해당 지반 개량을 위한 각종 지반보강법들에 대한 이해와 현장 적용법을 제시할 수 있도록 교육한다.

3. Class types and activities

To enhance students understanding and practical capability on foundation design and ground improvement practices, up-to-date 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.

Due to the novel COVID-19 restrictions, lectures are planned to be delivered online through Blackboard Collaborate. However, if allowed, in-class lectures will be provided with online live streams together. All online lectures will be recorded.

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 analyzing 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

토질역학, 재료역학, 유체역학, 수리학

8. Method of Evaluation

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance		10%	
midterm exam	1회	20%	
final exam	1회	30%	
quiz	2회	10%	진도관련 퀴즈 2회
presentation	1회	10%	조별과제 1회 발표
discussion	1회	5%	조별과제 1회 토론
homework	3회	15%	진도과제 2회 (10%) + 조별과제 보고서 (5%)
etc			
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	기초공학	이상덕	씨아이알	2014

10. Class system and Class shedule

기초구조물별로 배경이론과 적용방법을 익히기 위하여 다음의 순서로 수업을 진행한다.

1. 기초이론 강의
2. 기초구조물의 역학적 관점 및 설계 주안점 강의
3. 기초지반 안정성 향상을 위한 지반보강법의 원리 및 설계법 강의
4. 조별과제를 통한 최신 기술 동향 분석, 발표 및 토론

< Class Schedule >

* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
1	기초공학 개요	E	Ilhan Chang	강의		
2	지반의 조사 및 현장시험	E	Ilhan Chang	강의		
3	지반지지력	E	Ilhan Chang	강의		
4	얕은기초	E	Ilhan Chang	강의 설계실습	진도 퀴즈	
5	깊은기초	E	Ilhan Chang	강의		
6	말뚝기초	E	Ilhan Chang	강의	진도 과제	
7	복합기초	E	Ilhan Chang	강의 설계실습		
8	중간고사	E	Ilhan Chang	시험	중간고사	
9	현장타설 기초	E	Ilhan Chang	강의		
10	특수지반에서의 기초형식	E	Ilhan Chang	강의	진도 퀴즈	
11	다짐 및 치환	E	Ilhan Chang	강의		
12	지하수 처리	E	Ilhan Chang	강의		
13	지반주입	E	Ilhan Chang	강의	진도 과제	
14	지반혼합	E	Ilhan Chang	강의		
15	과제 발표 및 토론	E	Ilhan Chang	발표수업	과제 보고서 및 발표	
16	기말고사	E	Ilhan Chang	시험	중간고사	

11. Other items of notification