Course Syllabus

1. **Course Title:** Practice of Engineering Geology
2. **Course Code:** PEGE210218
3. **Credit Units:** 1 credits (0/1/2) (0 units of theory/ 1 unit of practice/ 2 units of self-study)
   Duration: 9 weeks (0 hours of theory+5 hours of practice, and 10 hours of self-study per week)
4. **Course Instructors:**
   1/ MSc. Nguyễn Tổng
   3/ MSc. Lê Phương Bình
   4/ MSc. Lê Phương
5. **Course Requirements:**
   Prerequisite courses: None
   Previous courses: None
   Parallel courses: Engineering Geology (ENGE220118)
6. **Course Description:**
   This course provides the contents relating to engineering geological survey, such as planning of gathering engineering geological information, methods of engineering geological survey, analyzing and reporting results of engineering geological survey.
7. **Course goals:**

Goals	Goal description	Programme ELOs
G1	The knowledge relating to engineering geological information gathering for foundation design.	1.2
G2	Create, analyse and evaluate plans as well as results of engineering geological survey objectively and honestly for foundation design according to current technical standards.	2.1; 2.2; 2.5
G3	Be able to communicate flexibly and efficiently.	3.1; 3.2

8. **Course Learning Outcomes (CLOs)**

CLOs		CLO Description	Programme ELOs
G1	**G1.1**	Recognizing the concept, objective, task, technical requirements, the geological drilling and sampling process. Listing and describing the geological drilling equipment and soil testing.	1.2
G2	**G2.1**	Creating engineering geological survey proposals and reports.	2.1; 2.2
	G2.2	Applying standards of professional responsibility and ethics in the learning activities.	2.5

G3	**G3.1**	Organizing the work in groups: search documents and discussions.	3.1
	G3.2	Choosing appreciable communication skills such as speech, text, images, graphics ... when expressing personal views and writing laboratory reports.	3.2

9. Learning resources:

All following learning resources will be sent to the student throughout learning management system (LMS) of the University.

- Textbooks:

[1] Võ Phán, " In-Situ and Laboratory Test Methods for Soil Construction ", Ho Chi Minh city National University Press,2012 (In Vietnamese).

[2] Vũ Công Ngữ, Nguyễn Thái, "In-situ testing soil and application ", scientific and technical publishers, 2006 (In Vietnamese).

- References:

[3] W.G. Curtin et al, Structural Foundation Designers' Manual, Blackwell publishing, 2006.

[4] Quido Záruba, Vojtëch Mencl,Engineering Geology, Elsevier Scientific Publishing Company, 1976.

[5] Geotechnical engineering department, "Soil Testing ", Ho Chi Minh city National University (In Vietnamese).

[6] TCVN 9363:2012- Construction surveying – Geotechnical surveys for tall buildings .

[7] TCVN 9437 – 2012 – Exploration drilling, sampling, and surveying .

[8] TCVN 8733:2012 - Soil materials - Methods of sampling, transportation, selection and storage of samples for laboratory experiments .

[9] TCVN 9155 : 2012 - Irrigation works - Technical requirements for drilling in geological survey.

[10] TCVN 9351:2012 – Soil materials - Standard penetration testing (SPT).

[11] TCVN 9352:2012 – Soil materials – Cone penetration testing. (CPT).

[12] TCVN 9354:2012 – Soil materials – Plate Load Testing. (PLT).

[13] TCVN 9148:2012– Irrigation works – Determination of hydraulic conductivity of the rock by the water absorption testing in boreholes.

[14] TCVN 9149:2012 – Irrigation works – Determination of hydraulic conductivity of the rock injection well testing in boreholes.

[15] TCVN 8723 : 2012 - Irrigation works - Methods of soil hydraulic conductivity in the laboratory.

10. Student assessment:

- Grading point: **10**
- Assessment plan

Type	Content	Timeline	Assessment method	CLOs	Rate (%)
Homework					**10**
BT	Lecturers must choose the knowledge of experiment 1 to 3 in order to meet the learning outcomes specified in the CLOs column. *(Demonstrating the*	Week 5	Exam + Homework.	**G1.1; G2.1; G2.2; G3.2.**	

	evidence in their own portfolio). ***Content suggested exercises*** 1. Presenting concepts of geological surveying. 2. Determine the number and minimum depth and layout of boreholes according to the current standards. 3. Creating brochure of geological drilling equipment. 4. Creating poster about geological drilling process. 5. Computing and reviewing the obtained results from field experiments.				
Presentation					**40**
TLN	The groups will make the presentation about field experiments in the following: 1. Standard Penetration Testing. 2. Cone Penetration Testing. 3. Piezecone (CPTu) Testing 4. Vane Shear Testing. 5. Dynamic Cone Penetration Testing. 6. Plate Load Testing. 7. Menard Pressuremeter Testing. 8. Experiments to determine the coefficient of permeability from field and lab soil testing. 9. Geostatistics and its applications in foundation design.	Week 7-8	Presentation + Rubrics	**G1.1 G2.2**; **G3.1;G3.2.**	
Final Report					**50**
	Final report.	Week 10	Report + Oral exam + Rubrics.	**G1.1; G2.1 G2.2**; **G3.2.**	

11. Course Content:

Week	Contents	CLOs
1	**Chapter 1: Overview of engineering geological survey** *(0/5h/10h)*	
	A/* Content and pedagogical methods in class:** (5h) **Contents:** ❖ The introduction to this course. ❖ Disseminate laboratory rules. ❖ ***Contents of this chapter. + General requirements.	**G1.1; G2.1.**

	+ The basic of creating the engineering geological survey proposal. + Technical requirements for engineering geological survey. + Geological history of the area. **Pedagogical methods** + Create learning event + Presenting the basic contents using powerpoint. + Small group discussions about 5 to 10 minutes.	
	B/*Self-study content**:(10h) + Find out literature relating to engineering geological survey. ***Lists of course materials + [1] [3] [4] [6] and [7]	**G1.1;** **G2.1;** **G2.2**
2	**Chapter 1: Overview of engineering geological survey** *(0/5h/10h) (cont')*	
	***A/* Content and pedagogical methods in class:** (5h) **Contents:** + Creating the plan of engineering geological survey. **Pedagogical methods** + Presenting the basic contents using powerpoint. + Small group discussions about 5 to 10 minutes. + Solving the problems relating to the plans of engineering geological survey.	
	B/* Self-study content**:(10h). + Homework: Creating the plan of engineering geological survey for the specific building (Attach in drawings). ***Lists of course materials + [1] [3] [4] [6] and [7].	
3	**Chapter 2: Geological drilling methods** *(0h/5h/10h)*	
	A/ **Content and pedagogical methods in class:** (5h) **Contents:** + Primary steps of geological drilling procedure. + Engineering geological equipment. + Sampling. + Borehole record. **Pedagogical methods** + Presenting the basic contents using powerpoint. + Small group discussions about 5 to 10 minutes. + Problem-solving on the procedure of drilling with the support of videos	**G1.1;** **G2.2**
	B/* Self-study content**:(10h). + Creating a brochure of geological drilling equipment. + Creating a poster about geological drilling procedure. ***Lists of course materials + [1] [3] [4] [6] and [7]	**G1.1;** **G2.2;** **G3.2.**

4	**Chapter 3: Field and laboratory soil testing** *(0/5h/10h)*	
	A/ **Content and pedagogical methods in class:** (5h) **Contents:** **Laboratory soil testing:** (2h) + Introduction to laboratory soil tests. **Field soil testing:** (3h) + Standard Penetration Testing. **Pedagogical methods** + Presenting the basic contents using powerpoint. + Small group discussions about 5 to 10 minutes. + Solving problems through small exercises to handle results of several field experiments.	**G1.1;** **G2.1;** **G2.2.**
	B/* Self-study content**:(10h) + Find out literature of lab soil tests. + Build flowchart of Standard Penetration Testing procedure. ***Lists of course materials + [1], [2], [3], [5] [8] and [16].	**G1.1;** **G2.2;** **G3.2.**
5	**Chapter 3: Field and laboratory soil testing** *(0/5h/10h)*	
	A/ **Content and pedagogical methods in class:** (5h) **Contents:** **Field soil testing:** (5h) + Cone Penetration Testing. + Vane Shear Testing. + Menard Pressuremeter Testing. + Application of field soil test results for foundation design. **Pedagogical methods** + Presenting the basic contents using powerpoint. + Small group discussions about 5 to 10 minutes. + Solving problems through small exercises to handle results of several field soil tests.	**G1.1;** **G2.1;** **G2.2.**
	B/* Self-study content**:(10h) Build flowchart of Cone Penetration Testing, Vane Shear Testing, and Menard Pressuremeter Testing procedure. ***Lists of course materials + [1], [2], [3], [5] [8] and [16].	**G1.1;** **G2.2;** **G3.2.**
6	**Chapter 4: Report of geological drilling survey** *(0h/5h/10h)*	

	A/ **Content and pedagogical methods in class:** (5h) **Contents:** + Recognize soil and rock on the site. + Contents of engineering geological report. + Drawing borehole log and geologic cross sections. + Some contents of geostatistics **Pedagogical methods** + Presenting the basic contents using powerpoint. + Solving problems through small exercises relating to drawing borehole log and geologic cross sections.	**G1.1;** **G2.2;** **G3.1;** **G3.2.**
	B/* Self-study content**:(10h) + Drawing borehole log and geologic cross sections for a specific building. + Summarizing and editing engineering geological report. ***Lists of course materials + [1], [2], [3], [5] [8] and [16].	**G1.1** **G2.2;** **G3.1;** **G3.2.**
7	**Chapter 4: Report of geological drilling survey** *(0h/5h/10h) (cont)*	
	A/ **Content and pedagogical methods in class:** (5h) **Contents:** + Group Presentation: Group 1; 2 **Pedagogical methods** + Listening. + Group presentation. + Feedback of lecturer on the group's essay. + Question - answer between the members of the class and the lecturer with group presentations. + Group-working. + Discussion. + Using group presentation rubrics. + Details in regulations of group working are attached.	**G1.1** **G2.2;** **G3.1;** **G3.2.**
	B/* Self-study content**:(10h) + Synthetic and edit the contents of the report have been commented their classmates and lecturer before resubmit. ***Lists of course materials + [1], [2], [3], [5] [8] and [16].	**G1.1** **G2.2;** **G3.1;** **G3.2.**
8	**Chapter 4: Report of geological drilling survey** *(0h/5h/10h) (cont)*	
	A/ **Content and pedagogical methods in class:** (5h) **Contents:** + Group Presentation: Group 3; 4 **Pedagogical methods** + Listening. + Group presentation. + Feedback of lecturer on the group's essay. + Question - answer between the members of the class and the lecturer	**G1.1** **G2.2;** **G3.1;** **G3.2.**

	with group presentations. + Group-working. + Discussion. + Using group presentation rubrics. + Details in regulations of group working are attached.	
	B/* Self-study content**:(10h) + Synthetic and edit the contents of the report have been commented their classmates and lecturer before resubmit. ***Lists of course materials + [1], [2], [3], [5] [8] and [16].	**G1.1** **G2.2;** **G3.1;** **G3.2.**
9	**Chapter 5: Geological drilling apprenticeship** *(0/5/10)*	
	A/ **Content and pedagogical methods in class:** (5h) **Learning contents in the field:** + Drilling and sampling three boreholes, each borehole is 20m depth. + Conducting Standard Penetration Test. + Describing soils in the field. + Recording data of the obtained samples . **Pedagogical methods:** + Observation guide: Conducting of a number sample manipulation and requiring students to perform, such as sampling, preservation of soil samples and describe soil sample by eye and hand. + Students record and describe the data of the obtained samples: Collecting data to create reports. + Some attentions while teaching in the field: In the 15 minutes before the start of sessions, lectures will notify the rules on labor safety and the work to be done: ▪ Students must observe intentionally. ▪ Students are encouraged to questions about the issues which they do not understand when observing and to record. ▪ Students should talk to their friends, lecturer or geological technicians. ▪ Students have to record images with the camera or phone to make materials as a final report. ▪ Students must perform the required manipulations of the lecturer on soil samples.	**G1.1** **G2.2** **G3.2**
	B/* Self-study content**:(10h) + Conducting to handle the data of soil samples. + Creating and drawing the layout of the boreholes. + Drawing borehole log and geologic cross sections. ***Lists of course materials + Tài liệu [1], [2], [3], [5] [8] and [16].	**G1.1** **G2.2** **G3.2**

12. Learning Ethics:

Student won't be permitted to do oral exam at the end of the course if they don't complete one of the following two criteria:

- Attendance : At least 80% of lecture hour
- Report: completing 100% of the content of reports.

Home assignments and report must be done by the students themselves. Plagiarism found in the assessments will get zero points.

13. Date of first approval: August 1st, 2012.

14. Approved by:

Dean	Head of Department	Instructor
A/Prof.Dr. Nguyễn Trung Kiên	**Dr. Trần Văn Tiếng**	**MSc. Nguyễn Tổng**

15. Date and Up-to-date content

1st time: Date: -	Instructor: Head of Department: