Course Syllabus

1. **Course Title:** Soil Mechanics Test
2. **Course Code:** SMTE210418
3. **Credit Units:** 1 credits (0/1/2) (0 units of theory/ 1 unit of practice/ 2 units of self-study)
   Duration: 6 weeks (0 hours of theory+5 hours of practice, and 10 hours of self-study per week)
4. **Course Instructors:**
   1/ MSc. Nguyễn Tổng
   2/ Dr. Nguyễn Minh Đức.
   3/ MSc. Lê Phương Bình
   4/ MSc. Lê Phương.
5. **Course Requirements:**
   Prerequisite courses: None
   Previous courses: None
   Parallel courses: Soil Mechanics (SOME240318)
6. **Course Description:**
   This course provides the contents relating to laboratory tests to determine soil properties. It also teaches students how to gather and evaluate testing results to report engineering geological survey for foundation design.
7. **Course goals:**

Goals	Goal description	Programme ELOs
G1	The knowledge relating to laboratory test to determine soil properties for foundation design.	1.2
G2	Be able to conduct experiments, analyse data, evaluate testing results objectively and honestly according to current 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**	Listing, describing and explaining theoretical basis of experiments determining soil properties.	1.2
	G2.1	Conducting, analyzing and evaluating the testing results based on the current technical standards and testing purposes.	2.1; 2.2
	G2.2	Applying standards of professional responsibility and ethics in the learning activities.	2.5
G3	**G3.1**	Working in the group effectively as a team member or leader.	3.1
	G3.2	Choosing appreciable communication skills such as speech,	3.2

		text, images, graphics ... when expressing personal views and writing laboratory reports.	

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).

- References:

[2] TCVN 4195 : 2012 "Soil materials – Determination of unit weight of soil in the laboratory." (In Vietnamese)

[3] TCVN 4196 : 2012" Soil materials –Determination of water content of soil in laboratory "(In Vietnamese)

[4] TCVN 4197 : 2012" Soil materials – Determination of liquid limit and plastic limit of soil in the laboratory. " (In Vietnamese).

[5] TCVN 4198 : 2012" Soil materials –Determination of grain size distribution of soil in the laboratory. "(In Vietnamese)

[6] TCVN 4199 : 2012" Soil materials – Determination of shear strength of soil by the direct shear test. "(In Vietnamese).

[7] TCVN 4200 : 2012" Soil materials – Determination of compressibility of soil by standard consolidation test "(In Vietnamese).

[8] TCVN 4201 : 2012" Soil materials – Determination of relation between water content and dry unit weight of soil in the laboratory. "(In Vietnamese).

10. Student assessment:

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

Type	Content	Timeline	Assessment method	CLOs	Rate (%)
Assessment of working group activities on conducting experiments					**50**
Working group	Assessment of student activities in the groups on conducting experiments. Each review is 5% of scores for each session.	Week 1 to week 5	Rubrics	**G1.1; G2.1; G2.2; G3.1**	20
Homework assignments					
Assignment 1	Lecturers must choose the knowledge of experiment 1 to 3 in order to meet the learning outcomes specified in the CLOs column. *(Demonstrating the evidence in their own portfolio).*	Week 2	Group exercises at home	**G1.1; G2.2; G3.2**	15
Assignment 2	Lecturers must choose the knowledge of experiment 4 to 6 in order to meet the learning outcomes specified in the CLOs column. *(Demonstrating the evidence in*	Week 5	Group exercises at home	**G2.1; G2.2; G3.2**	15

	their own portfolio).				
Final report					**50**
	Final report:+ Stating the purpose, equipment, processes of experiments + Stating experimental data, data processing, and experimental results. + Reviewing results and interpreting errors. + Oral examination.	Week 7	Report + Oral exam + Rubrics	**G1.1; G2.1; G2.2; G3.2**	

11. Course Content:

Week	Contents	CLOs
1	**Chapter 1: Unit weight and water content test** (0/5h/10h)	
	A/* Content and pedagogical methods in class:** (5h) **Contents:** ❖ The introduction to the course. ❖ Disseminate laboratory rules. ❖ ***Contents of soil unit weight test: + Definition of soil unit weight. + Methods for determining soil unit weight. + Equipment of soil unit weight test. + Preparation of soil samples. + Test procedure. + Computation. + Reviewing results and interpreting errors. ❖ ***Contents of soil waters content test:*** + Definition of soil water content. + Methods for determining soil water content. + Equipment of soil water content test. + Preparation of soil samples. + Test procedure. + Computation. + Reviewing results and interpreting errors. **Pedagogical methods** + Presenting the basic contents using poster and powerpoint. + Dividing the groups, introducing laboratory equipment, manipulating on the soil sample, distributing the practical manual and rubrics. + Supervising and guiding experimental activities. + Evaluating experimental activities by rubrics.	G1.1; G2.1; G2.2; G3.1; G3.2

	B/* Self-study content**: (10h) + Computing and reviewing soil unit weight test results, and interpreting its errors. + Computing and reviewing soil water content test results, and interpreting its errors + Reading experimental documents and standards. ***Lists of course materials + [1] [2] and [3]	G2.1; G2.2; G3.2
2	**Chapter 2: Atterberg limit test** (0h/5h/10h)	
	***A/* Content and pedagogical methods in class:** (5h) **Contents:** + Definition of liquid limit of soil. + Methods for determining the liquid limit of soil. + Equipment of the liquid limit test. + Preparation of soil samples. + Test procedure. + Computation. + Reviewing results and interpreting errors. + Definition of plastic limit of soil. + Methods for determining the plastic limit of soil. + Equipment of the plastic limit test. + Preparation of soil samples. + Test procedure. + Computation. + Reviewing results and interpreting errors. **Pedagogical methods:** + Reviewing all data processing results of experiment 1 and answering questions (if any) of the students on the related contents. + Presenting the basic contents using poster and powerpoint. + Introducing laboratory equipment, manipulating on the soil sample, distributing the practical manual and rubrics. + Supervising and guiding experimental activities. + Evaluating experimental activities by rubrics. + Guiding data processing using Excel tools to do assignment 1	G1.1; G2.1; G2.2; G3.1; G3.2
	B/* Self-study content**: (10h) + Computing and reviewing liquid limit test results of soil, and interpreting its errors. + Computing and reviewing plastic limit test results of soil, and interpreting its errors. + Draw N-w(%) chart and finding the liquid limit of soil. + Reading experimental documents and standards and doing group exercise at home. ***Lists of course materials + [1] and [4]	G2.1; G2.2; G3.2

3	**Chapter 3: Grain size analysis test** (0/5h/10h)	
	***A/* Content and pedagogical methods in class:** (5h) **Contents:** + Classification of soil + Methods for determining grain size distribution of soil: wet and dry sieve method and hydrometer method. + Equipment + Preparation of soil samples. + Test procedure. + Computation + Reviewing results and interpreting errors. **Pedagogical methods:** + Reviewing all data processing results of experiment 2, assignment 1 and answering questions (if any) of the students on the related contents. + Presenting the basic contents using poster and powerpoint. + Introducing laboratory equipment, manipulating on the soil sample, distributing the practical manual and rubrics. + Supervising and guiding experimental activities. + Evaluating experimental activities by rubrics.	G1.1; G2.1; G2.2; G3.1; G3.2
	B/* Self-study content**: (10h) + Computing and reviewing grain size distribution test results of soil, and interpreting its errors. + Drawing particle size distribution curve. + Reading experimental documents and standards. ***Lists of course materials + [1] and [5]	G2.1; G2.2; G3.2
4	**Chapter 4: Moister-Density relation test** (0h/5h/10h)	
	***A/* Content and pedagogical methods in class:** (5h) **Contents:** + Overview. + The purpose of soil compaction + The method for determining standard compaction of soil. + Equipment + Preparation of soil samples. + Test procedure. + Computation + Reviewing results and interpreting errors. **Pedagogical methods:** + Reviewing all data processing results of experiment 3 and answering questions (if any) of the students on the related contents. + Presenting the basic contents using poster and powerpoint. + Introducing laboratory equipment, manipulating on the soil sample, distributing the practical manual and rubrics. + Supervising and guiding experimental activities.	G1.1; G2.1; G2.2; G3.1; G3.2

	+ Evaluating experimental activities by rubrics.	
	B/* Self-study content**: (10h) + Computing and reviewing compaction test results and interpreting its errors. + Drawing moisture – dry unit weight curve and finding maximum dry unit weight value. + Reading experimental documents and standards. ***Lists of course materials + [1] and [8]	G2.1; G2.2; G3.2
5	**Chapter 5: Direct shear test** (0h/5h/10h)	
	***A/* Content and pedagogical methods in class:** (5h) **Contents:** + Overview. + The method for determining shear strength of soil. + Equipment + Preparation of soil samples. + Test procedure. + Computation. + Reviewing results and interpreting errors. **Pedagogical methods:** + Reviewing all data processing results of experiment 1 and answering questions (if any) of the students on the related contents. + Presenting the basic contents using poster and powerpoint. + Introducing laboratory equipment, manipulating on the soil sample, distributing the practical manual and rubrics. + Supervising and guiding experimental activities. + Evaluating experimental activities by rubrics. + Guiding data processing using Excel tools to do assignment 2.	G1.1; G2.1; G2.2; G3.1; G3.2
	B/* Self-study content**: (10h) + Computing and reviewing direct shear test results and interpreting its errors. + Drawing vertical stress – horizontal stress curve, finding c,φ. + Reading experimental documents and standards and doing group exercise at home. ***Lists of course materials + [1] and [6]	G2.1; G2.2; G3.2
6	**Chương 6: Consolidation test** (0/5/10)	
	***A/* Content and pedagogical methods in class:** (5h) **Contents:** + Overview. + The method for determining the compressibility of soil. + Equipment + Preparation of soil samples. + Test procedure.	G1.1; G2.1; G2.2; G3.1; G3.2

	+ Computation + Reviewing results and interpreting errors. **Pedagogical methods:** + Reviewing all data processing results of experiment 1, assignment 2 and answering questions (if any) of the students on the related contents. + Presenting the basic contents using poster and powerpoint. + Discussing with the guidance. + Guide data processing with advanced Excel tools and VBA programming.	
	B/* Self-study content**: (10h) **Các nội dung tự học**: + Computing and reviewing consolidation test results and interpreting its errors. + Drawing (H_o-ΔH) - (logt) curve and finding the coefficient of consolidation. ***Lists of course materials + [1] and [7]	G2.1; 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 for all experiments.-

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: