



**Universitas Negeri Surabaya
Faculty of Engineering
Civil Engineering Undergraduate Study Program**

Document
Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																																																			
Foundation Design	2220103149	Compulsory Study Program Subjects	T=3	P=0	ECTS=4.77	4	April 28, 2023																																																																			
AUTHORIZATION		SP Developer	Course Cluster Coordinator			Study Program Coordinator																																																																				
		Dra. Nur Andajani, M.T.	Dra. Nur Andajani, M.T.			Yogie Risdianto, S.T., M.T.																																																																				
Learning model	Case Studies																																																																									
Program Learning Outcomes (PLO)	PLO study program which is charged to the course																																																																									
	Program Objectives (PO)																																																																									
	PO - 1	Able to calculate shallow foundations and deep foundations, able to analyze underground structure calculations																																																																								
	PO - 2	Able to be responsible for work in the field of foundation engineering assigned to him in accordance with established quality standards																																																																								
	PLO-PO Matrix																																																																									
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>P.O</td></tr> <tr><td>PO-1</td></tr> <tr><td>PO-2</td></tr> </table>	P.O	PO-1	PO-2																																																																					
P.O																																																																										
PO-1																																																																										
PO-2																																																																										
PO Matrix at the end of each learning stage (Sub-PO)																																																																										
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">P.O</th> <th colspan="16">Week</th> </tr> <tr> <th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th> </tr> </thead> <tbody> <tr> <td>PO-1</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-2</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table>	P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	PO-1																	PO-2																						
P.O	Week																																																																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																																																										
PO-1																																																																										
PO-2																																																																										
Short Course Description	This course provides an understanding of the meaning and function of foundations, types and types of foundations as well as an understanding of calculating the bearing capacity of foundations, both shallow foundations and deep foundations. Calculation of the bearing capacity of shallow foundations with homogeneous soil and layered soil with centric vertical loads, centric inclination, with one and two direction eccentricity, for both sand and clay soils. Calculate shallow foundation settlement. Provides an understanding of the calculation of the bearing capacity of foundations in piles for sand and clay soils, homogeneous and layered soils and retaining walls.																																																																									
References	Main :																																																																									
	1. Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston 2. Andayani, Nur. 2012. Pondasi Dangkal. Jurusan Teknik Sipil Unesa.																																																																									
	Supporters:																																																																									
	1. Hardiyatmo, H C. 2002. Teknik Pondasi I. Penerbit Beta Offset. Yogyakarta.																																																																									
Supporting lecturer	Dra. Nur Andajani, M.T. Mochamad Firmansyah Sofianto, S.T., M.Sc., M.T.																																																																									
Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)																																																																			
		Indicator	Criteria & Form	Offline (offline)	Online (online)																																																																					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)																																																																			

1	Able to understand the meaning of foundations, the main function of foundations, recognize the various shapes and types of shallow and deep foundations	-Able to explain the meaning & function of foundations as well as the various forms and types of shallow and deep foundations	Criteria: Full marks are obtained if you do all the questions correctly Form of Assessment : Participatory Activities	Lectures, discussions and questions and answers 3 X 50	Lectures, discussions and questions and answers (3 x 50 minutes theory)	Material: Understanding shallow and deep foundations Reference: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston	3%
2	Able to understand shear failure in shallow foundations, Able to calculate the bearing capacity of shallow foundations with vertical centric loads according to the Terzaghi formula	Able to calculate the bearing capacity of a shallow foundation with a vertical centric load with overall shear failure and local shear failure, calculate the bearing capacity of a shallow foundation with a vertical centric load according to Terzaghi	Criteria: Full marks are obtained if you do all the questions correctly Form of Assessment : Participatory Activities, Portfolio Assessment	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments		Material: Foundations with centric and vertical loads Reference: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston	2%
3	Able to understand the influence of ground water level on calculating the bearing capacity of foundations	Able to analyze the influence of ground water level on calculating the bearing capacity of foundations - Able to calculate the bearing capacity of shallow foundations with MAT conditions	Criteria: Full marks are obtained if you do all the questions correctly Form of Assessment : Participatory Activities, Portfolio Assessment	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments	Material: The effect of MAT on the bearing capacity of foundations Reference: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston	3%
4	Able to understand shallow foundations with MAT and inclined centric loads	Able to calculate the bearing capacity of shallow foundations with the influence of MAT and inclined centric loads	Criteria: Full marks are obtained if you do all the questions correctly Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments	Lectures, discussions and questions and answers as well as assignments (3 x 50 minutes theory)	Material: Effect of MAT and inclined load on shallow foundations Reference: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston	4%
5	Able to understand shallow foundations with one-way and two-way eccentric loads	Able to calculate the bearing capacity of shallow foundations with eccentric loads	Criteria: Full marks are obtained if you do all the questions correctly Form of Assessment : Participatory Activities, Portfolio Assessment	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments	Lectures, discussions and questions and answers as well as assignments (3 x 50 minutes theory)	Material: Shallow foundations with one-way and two-way eccentric loads Reference: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston	4%
6	Able to understand shallow foundations on layers of clay and sand	determine the bearing capacity of shallow foundations on layers of clay and sand	Criteria: Full marks are obtained if you do all the questions correctly Form of Assessment : Participatory Activities	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments	Lectures, discussions and questions and answers as well as assignments (3 x 50 minutes theory)	Material: Shallow foundations on sand and clay soil Reference: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston	4%
7	Able to understand settlement calculations for shallow foundations	calculate shallow foundation settlement	Criteria: Full marks are obtained if you do all the questions correctly Form of Assessment : Participatory Activities, Portfolio Assessment	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments	Lectures, discussions and questions and answers as well as assignments (3 x 50 minutes theory)	Material: subsidence of shallow foundations References: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston	4%

8	Students are able to take the Mid-Semester Examination (UTS)	Able to do UTS questions	<p>Criteria: Full marks are obtained if you do all the questions correctly</p> <p>Forms of Assessment : Participatory Activities, Portfolio Assessment, Tests</p>	giving UTS 2 X 50 questions	giving UTS 2 X 50 questions	<p>Material: UTS question material Reader: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston</p>	20%
9	able to understand foundations in piles and drilled piles	can determine when to use deep foundations, can calculate the bearing capacity of piles	<p>Criteria: Full marks are obtained if you do all the questions correctly</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions and questions and answers 3 X 50	Lectures, discussions and questions and answers 3 X 50	<p>Material: Understanding and calculating foundations in piles Reference: Andayani, Nur. 2012. Shallow Foundations. Unesa Civil Engineering Department.</p>	4%
10	Able to understand laboratory data pile calculations for homogeneous sandy soil	calculate the bearing capacity of shallow foundations for homogeneous sandy soil	<p>Form of Assessment : Participatory Activities, Portfolio Assessment</p>	Lectures, discussions, questions and answers and assignments 3X 50	Lectures, discussions, questions and answers 3 X 50	<p>Material: Foundations with laboratory data for homogeneous sandy soil Reference: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston</p>	4%
11	Students are able to understand foundations in piles based on sandy soil laboratory data	Able to understand laboratory data pile calculations for layered sandy soil	<p>Criteria: Full marks are obtained if you do all the questions correctly</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments	3 X 50	<p>Material: Foundation with layered sand. Reference: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston</p>	4%
12	Students are able to understand foundations in piles based on laboratory data for homogeneous clay & layered clay	Able to calculate the bearing capacity of foundations in piles based on laboratory data for homogeneous clay & layered clay	<p>Criteria: 1.- Students listen to the lecturer's explanation, ask questions & discuss. 2.- Able to do practice questions.</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments	Lectures, discussions and questions and answers as well as assignments (3 x 50 minutes theory)	<p>Material: Pile foundations based on laboratory data for homogeneous clay & layered clay. Reference: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston</p>	4%
13	Students are able to understand foundations in piles based on sondir data	Able to calculate the bearing capacity of foundations in piles based on sondir data	<p>Criteria: Full marks are obtained if you do all the questions correctly</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments	Lectures, discussions and questions and answers as well as assignments (3 x 50 minutes theory)	<p>Material: Pile foundations based on sondir data. Reference: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston</p>	3%
14	Students are able to understand the foundations of group piles	Able to calculate the bearing capacity of group pile foundations	<p>Criteria: Full marks are obtained if you do all the questions correctly</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments	Lectures, discussions and questions and answers as well as assignments (3 x 50 minutes theory)		4%
15	Students are able to understand the foundations of group piles	Able to calculate the bearing capacity of foundations in piles and drilled piles for sandy and clayey soils	<p>Criteria: Full marks are obtained if you do all the questions correctly</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments	Lectures, discussions and questions and answers as well as giving 3 X 50 assignments	<p>Material: Pile foundations Library group: Braja, M Das. 2012. Principles Of FoundationEngineering 1D. PWS-KENT: Boston</p>	3%

16		Able to calculate the bearing capacity of pile foundations for both sand and clay soil	Criteria: Full marks are obtained if you do the questions correctly Form of Assessment : Participatory Activities, Tests	Answer the UAS in writing 2x50 minutes	Answer the UAS in writing 2x50 minutes	Material: UAS questions Reader: Andayani, Nur. 2012. <i>Shallow Foundations</i> . Unesa Civil Engineering Department.	30%
----	--	----------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------	-------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------	-----

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	60.5%
2.	Project Results Assessment / Product Assessment	1.33%
3.	Portfolio Assessment	16.5%
4.	Test	21.67%
		100%

Notes

- Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
- The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
- Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
- Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
- Indicators for assessing** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities or performance of student learning outcomes accompanied by evidence.
- Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
- Forms of assessment:** test and non-test.
- Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
- Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
- Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
- TM=Face to face, PT=Structured assignments, BM=Independent study.