



**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																																
Drainage	2220102010		T=2	P=0	ECTS=3.18	7	July 18, 2024																																
AUTHORIZATION		SP Developer	Course Cluster Coordinator			Study Program Coordinator																																	
				Yogie Risdianto, S.T., M.T.																																	
Learning model	Project Based Learning																																						
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																						
	Program Objectives (PO)																																						
	PLO-PO Matrix																																						
		<table border="1" style="margin: auto;"> <tr> <td style="width: 100px; height: 30px; vertical-align: middle;">P.O</td> </tr> </table>						P.O																															
P.O																																							
	PO Matrix at the end of each learning stage (Sub-PO)																																						
	<table border="1" style="margin: auto;"> <tr> <td rowspan="2" style="width: 30px; height: 30px; vertical-align: middle;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 20px; height: 20px; text-align: center;">1</td> <td style="width: 20px; height: 20px; text-align: center;">2</td> <td style="width: 20px; height: 20px; text-align: center;">3</td> <td style="width: 20px; height: 20px; text-align: center;">4</td> <td style="width: 20px; height: 20px; text-align: center;">5</td> <td style="width: 20px; height: 20px; text-align: center;">6</td> <td style="width: 20px; height: 20px; text-align: center;">7</td> <td style="width: 20px; height: 20px; text-align: center;">8</td> <td style="width: 20px; height: 20px; text-align: center;">9</td> <td style="width: 20px; height: 20px; text-align: center;">10</td> <td style="width: 20px; height: 20px; text-align: center;">11</td> <td style="width: 20px; height: 20px; text-align: center;">12</td> <td style="width: 20px; height: 20px; text-align: center;">13</td> <td style="width: 20px; height: 20px; text-align: center;">14</td> <td style="width: 20px; height: 20px; text-align: center;">15</td> <td style="width: 20px; height: 20px; text-align: center;">16</td> </tr> </table>						P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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Short Course Description	This course provides an understanding of the history of drainage development in a particular area, especially in Indonesia. Definition, aims and objectives of drainage, network patterns and determining channel dimensions, hydrological analysis, regional rainfall (rainfall), Rain Intensity Curve, Practical ways to process rain intensity in forecasting flood discharge, watersheds, runoff, estimating peak flow rates and use of rational methods, use of the hydrograph method (HSS), flood forecast hydrographs, condition of the city of Surabaya, geographical position, topography, hydrology and land use, drainage system patterns, gravity flow, pump stations and average rainfall, special drainage, drainage , planning steps and use of planning criteria, technical flow aspects, basic hydraulic planning, basic concepts, conversion laws, flow, specific energy, depth of stable channel planning patterns, in-buildings in drainage and pump systems.																																						
References	Main :																																						
	<ol style="list-style-type: none"> 1. Anonim. 2015. Kumpulan Materi Kuliah Drainase Teknik Sipil FT-Unesa 2015 . Surabaya: Unipres. 2. Kusnan. 2015. Pengembangan Model Penanggulangan Banjir Kampus Unesa Ketintang . Surabaya: Unipres. 3. Kusnan. 2018. Drainase. Surabaya: Unipress. 4. Suripin. 2004. Sistem Drainase Perkotaan yang Berkelanjutan . Semarang: Andi. 5. Syarifudin, A. 2018. Drainase Perkotaan yang Berwawasan Lingkungan . Yogyakarta: Andi. 6. Wesli. 2018. Drainase Perkotaan . Yogyakarta: Graha Ilmu. 																																						
	Supporters:																																						
Supporting lecturer	Ir. Nurhayati Aritonang, M.T. Danayanti Azmi Dewi Nusantara, S.T., 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	Know the history of drainage development in a particular area, especially in Indonesia	Explain the background and development of drainage	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%
2	Understand the definition of the purpose and objectives of drainage	Explain the definition of the aims and objectives of Drainage	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%
3	Understand the types/kinds of network patterns and determine channel dimensions. Hydrological analysis and consistency test of hydrological data	1.Explains the types/kinds of network patterns and determines channel dimensions. 2.Hydrological analysis and consistency test of hydrological data	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%
4	Understand regional rainfall (rainfall) rain intensity curves practical ways to process and rain intensity forecast flood discharge watershed influence of watershed characteristics forest plants reservoirs absorption wells on flooding	1.Explains regional rainfall (rainfall) rain intensity curves, practical ways to process rain intensity 2.Estimating watershed area flood discharge due to watershed characteristics	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%
5	Understand the factors that influence runoff, estimate peak flow rates and rational methods	1.Explain the runoff factors that influence runoff 2.Estimating peak flow rate and rational methods	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%
6	Understand the Hydrograph Method (HSS) Hydrograph Unit Hydrograph and flood forecasting	Explains the Hydrograph Method (HSS) Hydrograph Unit Hydrograph. Estimating flood forecasts	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%

7	Understand flood forecasting, unit hydrograph components that make up river hydrographs, depletion curves, synthetic hydrographs and reservoir pond routing.	1.Explains the flood unit hydrograph components that form a river hydrograph, synthetic hydrograph depletion curve and tendon pool routing 2.Estimating floods using component hydrograph units that form river hydrographs synthetic hydrograph depletion curves and reservoir pond routing	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%
8	UTS	UTS	Criteria: UTS	UTS 2 X 50			0%
9	Understand the various drainage facilities required	Determine drainage facilities that are appropriate to their function.	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%
10	Determine the discharge plan for highway drainage with transverse and longitudinal road slopes. - Calculate the dimensions of highway edge channels.	Determine the discharge plan for highway drainage with transverse and longitudinal road slopes. - Calculate the dimensions of highway edge channels.	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 5 X 50			0%
11	Understanding the urban drainage master plan (ex: SDMP Surabaya) Getting to know regional and non-regional drainage systems in urban drainage	Understanding the urban drainage master plan (ex: SDMP Surabaya) Getting to know regional and non-regional drainage systems in urban drainage	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%
12	Creating a Drainage Network system - Identifying the size of the catchment area - Identifying the length of the channel - Calculating the drainage time	Creating a Drainage Network system - Identifying the size of the catchment area - Identifying the length of the channel - Calculating the drainage time	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%
13	Calculating drainage plan discharge - Calculating dimensions of drainage channels - Calculating storage pond requirements	Calculating drainage plan discharge - Calculating dimensions of drainage channels - Calculating storage pond requirements	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%
14	Understand the SOP of the drainage system with its supporting facilities. Storage Pool/Busem etc. - Door System - Pump System	Understand the SOP of the drainage system with its supporting facilities. Storage Pool/Busem etc. - Door System - Pump System	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%

15	Calculate the planned capacity of subsurface drainage at the stadium/field	Can create a subsurface drainage network. Can determine the dimensions of subsurface drainage pipes	Criteria: Full marks are obtained if you do the questions correctly and precisely	Question and answer presentation and reflection 2 X 50			0%
16	UAS	UAS	Criteria: UAS	UAS 2 X 50			0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
		0%

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** ability in the process and student learning outcomes are specific and measurable statements that identify the ability 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.