	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
DESIGN OF WATER BUILDINGS	2220101182	Compulsory Study Program Subjects	T=1	P=0	ECTS=1.59	4	January 26, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
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Learning model	**Project Based Learning**

Program Learning Outcomes (PLO)

PLO study program which is charged to the course

Program Objectives (PO)

PO - 1	Students can complete residential drainage design assignments
PO - 2	Students can complete irrigation area design assignments

PLO-PO Matrix

P.O
PO-1
PO-2

PO Matrix at the end of each learning stage (Sub-PO)

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

The Water Building Design course is a civil engineering building design course in the field of water, especially drainage and irrigation. In this course, students are given design assignments using an assisted lecture system. There are two independently structured tasks regarding the settlement drainage master plan and irrigation area planning. The task of designing residential drainage buildings is to start from creating a drainage network system, calculating drainage time, calculating the area of the cutoff area, calculating the runoff coefficient to obtain the discharge, dimensions and depiction of the required channel work and water structures. The tasks of designing irrigation buildings include: irrigation network systems and patterns, irrigation demand discharge, channel dimensions, and depiction of channel work and required auxiliary buildings. Assistance is carried out face to face, either directly or online. Assessments are carried out to determine the achievement of course learning outcomes through structured assignment reports provided.

References

Main :

1. Anonim. 2015. Kumpulan Materi Kuliah Drainase Teknik Sipil FT-Unesa 2015 . Surabaya: Unipres.
2. Jurnal Kajian Pendidikan Teknik Bangunan FT-Unesa.
3. Kusnan. 2015. Pengembangan Model Penanggulangan Banjir Kampus Unesa Ketintang . Surabaya: Unipres.
4. _____. 2012. Drainse Perkotaan . Surabaya: Unipres.
5. Suripin. Sistem Drainase Perkotaan yang Berkelanjutan . Semarang: Andi.
6. Varshney, R.M.1978. Engineering Hydrologi Irrigation Research Institute .
7. New Delhi: Central Water & Power Comission .

Supporters:

Supporting lecturer	Ir. Nurhayati Aritonang, M.T. Danayanti Azmi Dewi Nusantara, S.T., M.T. Siti Talitha Rachma, S.T., M.Sc.

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 explanation and division of tasks 1 Settlement Drainage Design	Students are able to understand the explanation and division of tasks 1 Settlement Drainage	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance, Questions and Answers, Reflection 1 X 50		**Material:** Development of drainage in an area **Reference:** *Suripin. Sustainable Urban Drainage Systems. Semarang: Andi.*	6%
2	Create a residential drainage network scheme in accordance with the site plan layout provided	Students are able to create a residential drainage network scheme according to the site plan layout provided	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance with 1 X 50 Report Draft		**Material:** Residential Drainage Design **Reference:** *Anonymous. 2015. Collection of 2015 FT-Unesa Civil Engineering Drainage Lecture Materials. Surabaya: Unipres.* **Material:** Residential Drainage Design **Literature:** _____. *2012. Urban Drainage. Surabaya: Unipres.*	6%
3	Calculating Hydrology: Calculation of flow concentration time and rainfall intensity	Students are able to calculate hydrology: Calculation of flow concentration time and rainfall intensity	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance with 1 X 50 Report Draft		**Material:** Residential Drainage Design **Library:** *Suripin. Sustainable Urban Drainage Systems. Semarang: Andi.*	6%
4	Calculating Hydrology: Calculation of the area of breaking area and drainage coefficient	Students are able to calculate hydrology: Calculation of the area of breaking off areas and drainage coefficients	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance with 1 X 50 Report Draft		**Material:** Residential Drainage Design **Reference:** *Anonymous. 2015. Collection of 2015 FT-Unesa Civil Engineering Drainage Lecture Materials. Surabaya: Unipres.*	6%

5	Calculating Hydraulics: Planning drainage channel dimensional requirements	Students are able to calculate hydraulics: planning drainage channel dimensional requirements	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance with 1 X 50 Report Draft		**Material:** Residential Drainage Design **Reference:** *Anonymous. 2015. Collection of 2015 FT-Unesa Civil Engineering Drainage Lecture Materials. Surabaya: Unipres.*	6%
6	Calculating Hydraulics: Calculation of channel plan slope and elevation	Students are able to calculate hydraulics: calculating the slope of the channel plan and elevation	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance with 1 X 50 Report Draft		**Material:** Residential Drainage Design **Library:** *Suripin. Sustainable Urban Drainage Systems. Semarang: Andi.*	6%
7	Calculating Hydraulics: Detailed drawings of channel designs and supporting structures	Students are able to calculate hydraulics: detailed drawings of channel designs and complementary buildings	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance with 1 X 50 Report Draft		**Material:** Residential Drainage Design **Library:** *Suripin. Sustainable Urban Drainage Systems. Semarang: Andi.*	6%
8	Complete Assignment 1 Design of Residential Drainage Buildings	Students are able to complete Assignment 1 Residential Drainage Building Design Report	**Criteria:** UTS **Form of Assessment** : Project Results Assessment / Product Assessment	Final Assignment Report 1 X 50		**Material:** Residential Drainage Design **Literature:** *_____. 2012. Urban Drainage. Surabaya: Unipres.*	6%
9	Know the explanation and distribution of tasks 2 Irrigation Area Design	Students are able to understand the explanation and distribution of tasks 2 Irrigation Area Design	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance, Questions and Answers, Reflection 1 X 50		**Material:** Irrigation Area Design **Reference:** *Varshney, RM1978. Engineering Hydrology Irrigation Research Institute.*	6%
10	Create an irrigation network scheme according to the given layout	Students are able to create an irrigation network scheme according to the layout given	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance with 1 X 50 Report Draft		**Material:** Irrigation Area Design **Reference:** *Varshney, RM1978. Engineering Hydrology Irrigation Research Institute.*	6%

11	Calculate Irrigation Water Requirements for each channel	Students are able to calculate irrigation water requirements for each channel	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance with 1 X 50 Report Draft		**Material:** Irrigation Area Design **Reference:** *Varshney, RM1978. Engineering Hydrology Irrigation Research Institute.*	6%
12	Calculating Primary, Secondary and Tertiary Channel Dimension Requirements	Students are able to calculate Primary, Secondary and Tertiary Channel Dimension Requirements	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance with 1 X 50 Report Draft		**Material:** Irrigation Area Design **Reference:** *Varshney, RM1978. Engineering Hydrology Irrigation Research Institute.*	6%
13	Calculate the required crossing structures (culverts) in irrigation canals	Students are able to calculate the required crossing structures (culverts) in irrigation canals	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance with 1 X 50 Report Draft		**Material:** Irrigation Area Design **Reference:** *Varshney, RM1978. Engineering Hydrology Irrigation Research Institute.*	6%
14	Calculate the required crossing structures (gutters or siphons) on irrigation channels	Students are able to calculate the required crossing structures (gutters or siphons) in irrigation canals	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance with 1 X 50 Report Draft		**Material:** Irrigation Area Design **Reference:** *Varshney, RM1978. Engineering Hydrology Irrigation Research Institute.*	6%
15	Create drawings and site plans for Bendung	Students are able to create drawings and site plans for dams	**Criteria:** Full marks are obtained if you do the questions correctly and precisely **Form of Assessment** : Project Results Assessment / Product Assessment	Assistance with 1 X 50 Report Draft		**Material:** Irrigation Area Design **Reference:** *Varshney, RM1978. Engineering Hydrology Irrigation Research Institute.*	6%
16	Complete Assignment 2 Irrigation Building Design	Students are able to complete Assignment 2 Irrigation Building Design Report	**Criteria:** UAS **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Final Report Assignment 2 1 X 50			10%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	5%
2.	Project Results Assessment / Product Assessment	95%
		100%

Notes

1. **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.
2. **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.
3. **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.
4. **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.
5. **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.
6. **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.
7. **Forms of assessment:** test and non-test.
8. **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.
9. **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.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **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%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.