



**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
Irrigation and Water Building Engineering	2220104097		T=4	P=0	ECTS=6.36	5	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						
		P.O					
Short Course Description	Students are able to explain the meaning, aims and objectives of Irrigation, irrigation network systems with nomenclature, calculating water demand discharge, water balance in water catchment buildings, designing 13 dimensions, drawing-calculating the volume of canal materials and water structures, designing-calculating, drawing and calculating the volume of materials The learning model used is direct learning, problematic learning. Learning methods: lecture, discussion/question and answer, assignments and presentations						
	References						
Supporting lecturer	Main :						
	1. Dirjen Pengairan. 1986. Pedoman Perencanaan Irigasi KP 01,02. 06, 07. Jakarta . 2. Mawardi Erman. 2007. Desain Bangunan Air . Alfabeta: Bandung 3. Suhardjono. 1994. Kebutuhan Air Tanaman . ITN: Malang 4. Dirjen Pengairan. 1986. Pedoman Perencanaan Petak Tersier KP 03,04,05 . Jakarta . 5. Indiah Kustini. 2014. Perencanaan Petak Tersier . Teknik Sipil FT UNESA 6. Indiah Kustini. 2017. Irigasi dan Bangunan air . Teknik Sipil FT UNESA 7. Indiah Kustini dan Bambang Sabariman. 2020. Merencana Bangunan Bendung . Teknik Sipil FT UNESA						
	Supporters:						
	INDIAH KUSTINI 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	Understanding Irrigation	<ol style="list-style-type: none"> 1. Students can: Purpose of irrigation 2. Irrigation water source 3. How to administer ail 4. Creating an Irrigation Network Scheme 5. Describe the types of irrigation channels 6. Describe the types of irrigation structures 	Criteria: Purpose of irrigation Sources of irrigation water How to provide ail Creating an Irrigation Network Scheme Describing types of irrigation channels Describing types of irrigation buildings	Direct learning model, via Zoom and Velearning Approach: problem based learning Strategy: CTL Method: question and answer, understanding via video Continued practice giving assignments and reading book chapter 155 4 X 50			0%
2	Understanding the Irrigation Network System	<ol style="list-style-type: none"> 1. Topographic map of irrigation areas 2. Irrigation Network Scheme 3. Function of irrigation networks 4. Tertiary plot boundaries and network criteria 5. Types of irrigation networks 6. Factors of plant water requirements in rice fields 7. Calculating discharge in tertiary plots 	Criteria: Using Unesa criteria	· Geogel meet direct learning model and through: velearning · Approach: problem based learning · Strategy: question and answer · Method: explanation, question and answer, giving assignments, presentation · Advanced training and assignment to calculate water needs 4 X 50			0%
3	Describe the irrigation network system, Calculate the water needs of plants in the fields Calculate the amount of discharge in the tapping structure from the planned planting pattern in the irrigation area	<ol style="list-style-type: none"> 1. Students can: Describe irrigation network systems, 2. Calculating the water needs of rice plants in rice fields 3. Describe planting patterns 4. Determine the planting intensity of the irrigation area 5. Group division 6. example of calculating debit from 	Criteria: porthopolio	Learning model: directly through geogel meet and velearning Approach: problem based learning Strategy: presentation Method: explanation, question and answer, giving assignments, Task to calculate the water needs of rice plants in rice fields 4 X 50			0%

4	Calculate the amount of discharge at the intake from the planned planting pattern in the irrigation area	<ol style="list-style-type: none"> 1. Students can: Determine the water needs of rice plants in rice fields 2. Division of groups for planning planting patterns 3. Determine planting intensity in irrigated areas 4. Calculate the amount of discharge at the intake from the planned planting pattern in the irrigation area 5. Determine the elevation height of the weir 6. Determine the dimensions of the water catchment building 	Criteria: Decree from Unesa	- Learning model: directly through geogel meet and Velearning - Approach: problem based learning - Strategy: Presentation - Method: explanation, question and answer, giving assignments - Advanced training and assignments to calculate water needs based on alternative 4 X 50 planting patterns			0%
5	Calculate the water balance at the intake	<ol style="list-style-type: none"> 1. Students can: Calculate debit based on planting patterns and groups in tertiary, secondary and intake plots 2. Calculating FPR and LPR based on planting patterns and groups in tertiary, secondary and in Inyake plots 3. Determining the land surface elevation in rice fields, related to the high line 4. Determine the elevation of building thresholds, doors and spillways, related to the height line 5. Make a long-view sketch complete with building elevation and water level 6. Create a water balance at the intake 	Criteria: Unesa provisions	Learning model: directly based on geogel meet, Velearning Approach: CTL Strategy: Presentation Method: explanation, question and answer, giving assignments Planting intensity tasks, dimensions of intake building 4 X 50			0%

6	Describe Irrigation Areas	<ol style="list-style-type: none"> 1. Students can: Explain the need for water in rice fields, in tertiary fields and at intakes 2. Determine the planting group 3. Determine planting intensity 4. Alternative planting pattern plans 5. Turn to give water 6. Tertiary plot water supply operations 7. Operation of giving at intake 8. Determine the elevation of rice fields 	Criteria: Unisa provisions	Learning model: direct, using geogel mett, velearning Approach: problem based learning Strategy: Presentation Method: explanation, question and answer, giving assignments, presentation Assignment to describe irrigation areas 4 X 50			0%
7	relationship between Measuring Building and Regulatory Building	<ol style="list-style-type: none"> 1. Students can: Differentiate the functions of measuring and regulating building types 2. Make a longitudinal sketch of the building 3. Calculate channel dimensions 4. Calculate measuring building dimensions 5. Calculate the building dimensions of the door 6. Determine the elevation in the building 7. Channel image description 8. Understand water movement in channels 	Criteria: Unisa's existing provisions	Learning model: direct learning with Zoom/Geogel meet and through velearning Approach: problem based learning Strategy: - Method: explanation, question and answer, giving assignments, presentations, practice in the laboratory/field observation Channel design assignment read chapters 5, 6, and draw sketches of existing buildings on the secondary channel 4 X 50			0%
8	UASCOMPLETE WATER BALANCE TASKS			4 X 50			0%
9	Calculating channels in 3 consecutive water structures Calculating channel dimensions Determining ground surface elevation and channel slope Making channel sketches Drawing channels	<ol style="list-style-type: none"> 1. Students can: Calculate channel dimensions 2. Determine the elevation of the ground surface, 3. channel slope 4. Create a channel sketch 5. draw channels 	Criteria: According to the provisions at Unesa	v Approach: Practice measuring using a Curent meter Learning model: directly via Google Meet and Velearning Approach: problem based learning Strategy: providing examples of drawings Method: lectures, media Advanced training assignments reading books designing drawing channels and calculating building materials 4 X 50			0%

10	Design 3 buildings in the secondary channel	<ol style="list-style-type: none"> 1. Students can: Make a sketch of a longitudinal section of the flow in a tapping structure 2. Depiction of the building and its sections 3. Notate work 4. Calculating the volume of work 	Criteria: Using the provisions at Unesa	Learning model: direct with Zoom and video learning applications, Approach: problem based learning Strategy: - Method: lecture, discussion, Advanced training, assignments, reading books, designing, drawing channels and calculating building materials 4 X 50			0%
11	Relief building design	<ol style="list-style-type: none"> 1. Students can: Differentiate relief buildings based on their function, 2. Calculating high energy losses in relief buildings 3. Relief building design 4. Drawing of relief buildings 5. Calculate the volume of the relief building 	Criteria: Using the provisions of Unesa	<ol style="list-style-type: none"> 1. Image media 2. Learning model: direct 3. Approach: problem based learning 4. Strategy: - 5. Method: lecture, reading, doing assignments 6. Advanced practice .drawing channels and calculating building materials 4 X 50			0%
12	Lay out the Tertiary Plot	<ol style="list-style-type: none"> 1. Students can; Explain the provisions for tertiary plot network design according to the provisions of the tertiary plot planning criteria 2. Distinguish high line types 3. Determine the land surface elevation in rice fields 4. Create a tertiary grid network name 	Criteria: Assessment provisions that apply at Unesa	Learning model: directly via Google meet and Velearning Approach: problem based learning Strategy: via video Method: lecture, example questions, exercises Advanced practice giving assignments reading books to create a 4 X 50 tertiary grid network			0%
13	Calculate the forces acting on water catchment structures	Can design water catchment buildings Can calculate the elevation of water catchment buildings Can design the shape of spillway buildings Can calculate the forces acting and moments that occur in spillway buildings	Criteria: Existing provisions	Direct learning model Question and answer method 4 X 50 media			0%

14	Calculating the stability of a fixed weir	1. Students can; Draw a cross section of a fixed bevel at a scale of 1:100 2. Can calculate building stability 3. Can calculate the volume of a building	Criteria: Using the provisions of Unesa	Learning model: direct with Zoom / Google Meet and Velearning applications Approach: problem based learning Strategy: giving assignments and presentations Method: lecture, question and answer, discussion, giving assignments. Advanced training on giving assignments to plan the 4 X 50 Weir			0%
15		Planning water catchment buildings	Criteria: using the provisions of the Unesa criteria	Learning model: direct with Zoom/geogel met velearning application, Approach: problem based learning Strategy: --Method: lecture, question and answer, discussion, giving assignments. Advanced practice giving assignments for planning tertiary boxes and reading books on tertiary plots and tertiary building planning 4 50			0%
16							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.