	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
Hydraulics and Fluid Mechanics		2220103145				T=2	P=1	ECTS=4.77	0	July 18, 2024
AUTHORIZATION		SP Developer			Course Cluster Coordinator			Study Program Coordinator		
		....			....			Yogie Risdianto, S.T., M.T.		

Learning model	Case Studies
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**
	Program Objectives (PO)
	PLO-PO Matrix

	P.O

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

Short Course Description	Introduction to fluid properties, definition of hydraulics, hydrostatic forces, buoyancy and floating, types of channels, basic fluid flow patterns, water surface profiles, channel bottom surface profiles, fluid flow in open channels, flow in closed channels/pipes and their application in practical work.

References	Main :
	1. Triatmodjo, B. 1991. Hidraulika. Beta Offset, Yogyakarta. 2. Anggraini. 1995. Saluran Terbuka. Jakarta: Erlangga. 3. Djoni Irianto. 2001. Hidrolika. Unesa Press. 4. Soemitro Herman Widodo, Ronald V. Giles. 1990. Mekanika fluida & Hidrolika . Jakarta: Erlangga 5. Suyatman dkk., Ven Te Chow. 1985. Hidrolika dan Saluran Terbuka. Jakarta: Erlangga 6. ASCE. 2015. Jurnal of Hydraulic Engineering.
	Supporters:

Supporting lecturer	Drs. Djoni Irianto, 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	Get to know the characteristics of hydraulics	Explain the characteristics of hydraulics	**Criteria:** The presentation was carried out coherently with appropriate intonation and emphasis, showed a good understanding of the concept, assisted by ppt media according to media criteria, answered the questioner correctly, was able to formulate suggestions for improving the Practical Result Report well and correctly	Discussion lectures and questions and answers 3 X 50			0%
2	Able to see the basic concepts of hydraulics, various hydrostatic pressure (floating) water flow patterns, Develop a compressible flow classification, water surface profile classification. Critical flow calculations draw the specific energy of the critical width of the channel.	Looking at the basic concepts of hydraulics, hydrostatic pressure flow patterns, developing a compressible flow classification section for water surface profile classification. The critical flow calculation step draws the specific energy of the critical channel width.	**Criteria:** The presentation was carried out coherently with appropriate intonation and emphasis, showed a good understanding of the concept, assisted by ppt media according to media criteria, answered the questioner correctly, was able to formulate suggestions for improving the Practical Result Report well and correctly	Discussion lectures and questions and answers. Exercise 9 X 50			0%
3							0%
4							0%
5	Able to calculate and demonstrate steady/unsteady uniform/ununiform laminar/turbulent flow, sub-critical, super-critical, conservation law, calculating critical depth, normal depth, calculating hydraulic jumps at bottom openings	Calculate and demonstrate the criteria for steady/unsteaduniform/ununiform laminar/turbulent flow patterns, sub-critical, super-critical, hydraulic conservation laws. Calculate critical depth normal depth. Evaluate the steps for calculating the hydraulic jump at the bottom opening of the door	**Criteria:** The presentation was carried out coherently with appropriate intonation and emphasis, showed a good understanding of the concept, assisted by ppt media according to media criteria, answered the questioner correctly, was able to formulate suggestions for improving the Practical Result Report well and correctly	Discussion lectures and questions and answers. Exercise 9 X 50			0%
6							0%
7							0%
8	UTS			3 X 50			0%
9	Get to know the characteristics of flow patterns in closed channels, uphold the basic concepts of closed channel hydraulics and channel modeling	Explains the characteristics of flow patterns, upholds the basic concept of the uniform movement of flowing water due to damming	**Criteria:** The presentation was carried out coherently with appropriate intonation and emphasis, showed a good understanding of the concept, assisted by ppt media according to media criteria, answered the questioner correctly, was able to formulate suggestions for improving the Practical Result Report well and correctly	Discussion lectures and questions and answers. Exercise 6 X 50			0%
10							0%

No	Sub-PO	Indicators	Criteria	Forms of learning			%
11	Able to calculate and operate flow in imperfect and perfect flumes, analyze positive and negative dammed water curve counters	Operating the difference between flow in a straight channel and flow in an imperfect and perfect ventury flume tool, Analyzing the difference in the calculation formula for positive and negative dams	**Criteria:** The presentation was carried out coherently with appropriate intonation and emphasis, showed a good understanding of the concept, assisted by ppt media according to media criteria, answered the questioner correctly, was able to formulate suggestions for improving the Practical Result Report well and correctly	Discussion lectures and questions and answers. Exercise 9 X 50			0%
12							0%
13	Able to calculate the impact of damming upstream using the Breese and Ruhlmann model, calculating constant water height (hm) and critical water height (hc),	Explaining the Breese and Ruhlmann calculation model, explaining the difference between constant water height (hm) and critical water height (hc)	**Criteria:** The presentation was carried out coherently with appropriate intonation and emphasis, showed a good understanding of the concept, assisted by ppt media according to media criteria, answered the questioner correctly, was able to formulate suggestions for improving the Practical Result Report well and correctly	Discussion lectures and questions and answers. Exercise 6 X 50			0%
14							0%
15	Able to prepare written reports calculating the movement of moving water to flow, calculating head loss in closed channels.	Prepare a complete written report on the calculation model for the movement of flowing water and the head loss that occurs at the channel cover	**Criteria:** The presentation was carried out coherently with appropriate intonation and emphasis, showed a good understanding of the concept, assisted by ppt media according to media criteria, answered the questioner correctly, was able to formulate suggestions for improving the Practical Result Report well and correctly	Discussion lectures and questions and answers. Exercise 6 X 50			0%
16							0%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
		0%

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** 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.
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.