



**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
Hydrology	2220102018	Compulsory Study Program Subjects	T=2	P=0	ECTS=3.18	3	July 28, 2023
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator	
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Learning model	Case Studies
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Program Learning Outcomes (PLO)	PLO study program which is charged to the course																																																																																																						
	Program Objectives (PO)																																																																																																						
	PO - 1	Able to apply hydrological knowledge to gain a thorough understanding of the basic principles of water civil engineering																																																																																																					
	PO - 2	Able to apply modern methods, skills and technical tools required for hydrological analysis.																																																																																																					
	PO - 3	Able to plan discharge as a basis for planning water buildings.																																																																																																					
	PO - 4	Able to evaluate flood discharge as a basis for carrying out flood mitigation.																																																																																																					
	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> <tr><td>PO-3</td></tr> <tr><td>PO-4</td></tr> </table>	P.O	PO-1	PO-2	PO-3	PO-4																																																																																																	
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	PO Matrix at the end of each learning stage (Sub-PO)																																																																																																						
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Short Course Description	The Hydrology course contains the knowledge that underlies water science in the field of civil engineering. This course discusses the hydrological cycle, rainfall, evapotranspiration, infiltration, hydrometry, runoff, planned rainfall, and flood tracking. Lectures are held face-to-face, either directly or online. Assessments are carried out to determine the achievement of course learning outcomes through structured assignments, quizzes, mid-semester exams and final semester exams.
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References	<p>Main :</p> <ol style="list-style-type: none"> 1. Asdak, C. 1995. Hidrologi dan Pengelolaan Daerah Aliran Sungai. GajahMada University Press. Yogya. 2. Linsley, dkk. 1991. Teknik Sumber Daya Air. Erlangga Jakarta. 3. Martha, J.W. 1978. Mengenal Dasar-dasar Hidrologi. Nova. Bandung 4. Nurhayati Aritonang, 2014. Hidrologi Teknik. Hand Out Unesa. Surabaya. 5. Soewarno. 2000. Hidrologi Operasional. PT Gramedia. Jakarta 6. Sri Harto. 1998. Hidrologi Terapan. Yogyakarta: Gama T. Sipil. 7. Sholeh, M. 1995. Hidrologi TS-1421. Surabaya: FTSP ITS. 8. Sosrodarsono, Suyono dan Takeda Kensaku. 1986. Hidrologi untuk Pengairan. Jakarta: Erlangga. 9. Subarkah, I. 1979. Bangunan Air. Idea Dharma. Bandung. 10. Wilson, E.M. 1993. Hidrologi Teknik. Jakarta: Erlangga.
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		Supporters:					
Supporting lecturer		Ir. Nurhayati Arintonang, 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	Able to define the meaning of hydrology and its use.	1.Explain the definition of hydrology. 2.Explain the meaning of hydrology 3.Explain the history of hydrology 4.Explain the use of hydrological applications	Criteria: Participation by asking/answering questions is awarded 5 points Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers. 2 X 50		Material: Understanding hydrology and its use. Reference: Asdak, C. 1995. <i>Hydrology and Watershed Management.</i> GajahMada University Press. Yogya.	4%
2	Be able to explain the definition of rain.	1.Explain the morphology of rainfall 2.Explain the capacity of rain 3.Explaining Intensity 4.Describes the duration of rainfall 5.Explain the types of rain 6.Explain the definition of rain 7.Explain the concept of rain 8.Explain the water balance 9.Explain the analysis of rain frequency	Criteria: Participation by asking/answering questions is awarded 5 points Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers. 2 X 50		Material: Rain Literature: Asdak, C. 1995. <i>Hydrology and Watershed Management.</i> GajahMada University Press. Yogya.	4%
3	Able to explain analyzing rain data.	1.Explains testing rain data 2.Explain the principle of reliable rainfall 3.Explain rainfall	Criteria: Participation by asking/answering questions is awarded 5 points Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers. 2 X 50		Material: Analysis of rain data. Reference: Asdak, C. 1995. <i>Hydrology and Watershed Management.</i> GajahMada University Press. Yogya.	4%

4	Able to explain and calculate average rainfall.	<ol style="list-style-type: none"> 1.Explains the determination of average rainfall calculations based on the Arithmetic method 2.Explains the determination of average rainfall calculations based on the Thiessen method 3.Explains the determination of average rainfall calculations based on the Isohyet method 	<p>Criteria: Participation by asking/answering questions is given a score of 5 points. Assignment assessment sheet (attached)</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, and assignments, 2 X 50 presentations		<p>Material: Average Rain</p> <p>Reference: <i>Martha, JW 1978. Understanding the Basics of Hydrology. Nova. Bandung</i></p>	4%
5	Able to explain and analyze evaporation, transpiration and infiltration.	<ol style="list-style-type: none"> 1.Explain the principles of evaporation, infiltration and hydrometry 2.Explain the mechanism of evaporation, infiltration. 	<p>Criteria: Participation by asking/answering questions is given a score of 5 points. Assignment assessment sheet (attached)</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, and assignments, 2 X 50 presentations		<p>Material: Analysis of evaporation, transpiration and infiltration</p> <p>References: <i>Linsley, et al. 1991. Water Resources Engineering. Erlangga Jakarta.</i></p>	3%
6	Able to calculate evaporation, transpiration and infiltration.	<ol style="list-style-type: none"> 1.Explain how to calculate evaporation. 2.Explain how to calculate transpiration. 3.Explain how to calculate infiltration. 	<p>Criteria: Participation by asking/answering questions is awarded 5 points</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, and assignment of practice questions, 2 X 50 presentations		<p>Material: Evaporation, transpiration and infiltration</p> <p>References: <i>Martha, JW 1978. Understanding the Basics of Hydrology. Nova. Bandung</i></p>	4%
7	Able to understand river discharge measurement analysis (hydrometry).	Explains the analysis of river discharge measurements (hydrometry) as a basic input for water building design.	<p>Criteria: Participation by asking/answering questions is given a score of 5 points. Assignment assessment sheet (attached)</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, and assignments, 2 X 50 presentations		<p>Material: Analysis of river discharge measurements (hydrometry)</p> <p>Reference: <i>Soewarno. 2000. Operational Hydrology. PT Gramedia. Jakarta</i></p>	4%
8	Able to carry out analysis of debit data measurements.	Carry out analysis of debit data measurements.	<p>Criteria: Participation by asking/answering questions is given a score of 5 points. Assignment assessment sheet (attached)</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, and giving practice questions, 2 X 50 presentations		<p>Material: Analysis of discharge data measurements</p> <p>References: <i>Linsley, et al. 1991. Water Resources Engineering. Erlangga Jakarta.</i></p>	3%
9	UTS		<p>Criteria:</p> <ol style="list-style-type: none"> 1.Weight: 20% 2.question no.1 20% 3.Question no.2 20% 4.Question no.3 10% 5.Question no.4 50% <p>Form of Assessment : Participatory Activities, Tests</p>	2 X 50			20%

10	Able to understand river flow hydrographs.	1.Explain the understanding of river flow hydrographs. 2.Determine the type of measurement scale	Criteria: Participation by asking/answering questions is awarded 5 points Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and assignments, 2 X 50 presentations		Material: River flow hydrographs References: <i>Martha, JW 1978. Getting to know the basics of hydrology. Nova. Bandung</i>	3%
11	Able to understand river flow hydrographs.	1.Explain the understanding of river flow hydrographs. 2.Determine the type of measurement scale	Criteria: Participation by asking/answering questions is awarded 5 points Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and assignments, 2 X 50 presentations		Material: River flow hydrographs References: <i>Martha, JW 1978. Getting to know the basics of hydrology. Nova. Bandung</i>	4%
12	Able to understand and analyze river flow hydrographs.	1.Able to understand river flow hydrographs 2.Able to analyze river flow hydrographs	Criteria: Participation by asking/answering questions is awarded 5 points Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and assignments, 2 X 50 presentations		Material: River flow hydrograph analysis Reference: <i>Asdak, C.1995. Hydrology and Watershed Management. GajahMada University Press. Yogya.</i>	3%
13	Able to understand and calculate design floods.	1.Explain flood calculations 2.Explain the method used to calculate the design flood	Criteria: The presentation score is 100 if tables, graphs, participation by asking/answering questions are given a value of 5 points Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and assignments, 2 X 50 presentations		Material: Flood design Reference: <i>Asdak, C.1995. Hydrology and Watershed Management. GajahMada University Press. Yogya.</i>	4%
14	Able to understand and calculate design floods.	1.Explain flood calculations 2.Explain the method used to calculate the design flood	Criteria: The presentation score is 100 if tables, graphs, participation by asking/answering questions are given a value of 5 points Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and assignments, 2 X 50 presentations		Material: Flood design References: <i>Martha, JW 1978. Getting to know the basics of hydrology. Nova. Bandung</i>	3%
15	Able to understand and analyze flood tracking as a concept for flood control.	1.Explains flood tracking analysis. 2.Explain the flood search method. 3.Explain the concept of flood control. 4.Explain the definition of understanding the concept of flooding	Criteria: Participation by asking/answering questions is awarded 5 points Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50		Material: Flood exploration as a concept for flood control Reference: <i>Soewarno. 2000. Operational Hydrology. PT Gramedia. Jakarta</i>	3%
16	UAS	UAS	Form of Assessment : Participatory Activities, Tests	UAS 2 x 50			30%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	75%
2.	Test	25%
		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** 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.