



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
Water Resources Development *	2220102078	Compulsory Study Program Subjects	T=2 P=0 ECTS=3.18	5	July 18, 2024

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 that is charged to the course
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Program Objectives (PO)	
PO - 1	Students can understand the importance of developing existing water resources for the benefit of society optimally and sustainably
PO - 2	Students can find out the potential availability and methods of utilization (operation) of water resources, preservation (conservation) of water resources, as well as efforts to control the destructive power of water
PO - 3	Students are able to innovate with various ideas to solve existing problems using the principles of integrated PSDA and IWRM for Water Resources
PO - 4	Students are able to choose the right water resources infrastructure to support PSDA activities

PLO-PO Matrix						
	<table border="1" style="width: 100%; text-align: center;"> <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-1						
PO-2						
PO-3						
PO-4						

PO Matrix at the end of each learning stage (Sub-PO)																																																																																																						
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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 prediction 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.
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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. Drainase 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:
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Supporting lecturer	Ir. Nurhayati Aritonang, M.T. Danayanti Azmi Dewi Nusantara, S.T., M.T.
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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 understand the background of PSDA, aims and objectives of Water Resources Development	Explain the background to the aims and objectives of PSDA	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities, Tests	Presentation, Lecture, Discussion Question/answer and reflection 2 X 50		Material: PSDA background, aims and objectives of Water Resources Development Library: Varshney, RM1978. Engineering Hydrology Irrigation Research Institute.	4%
2	Able to know and understand the fields of science related to Water Resources Development (PSDA), Human, Physical, and others	Explain the sciences related to Water Resources Development (PSDA), Human and Physical	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities	Presentation, Lecture, Discussion Question/answer and reflection 2 X 50			3%
3	Able to understand the development of the Scope of Water Resources Development, future challenges and Republic of Indonesia Law No: 4 of 2004 concerning Water Resources Development	Knowing development, future challenges and Republic of Indonesia Law No: 4 of 2004 concerning Water Resources Development	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities	Presentation, Lecture, Discussion Question/answer and reflection 2 X 50		Material: Scope of Water Resources Development, Future Challenges and Republic of Indonesia Law No: 4 of 2004 concerning Water Resources Development Library: Anonymous. 2015. Collection of 2015 FT-Unesa Civil Engineering Drainage Lecture Materials. Surabaya: Unipres.	4%
4	Able to understand and understand: Water resource potential in general, surface, swamps, beaches and water resource potential on land	Explains water resources in general, surface, swamps, beaches and soil potential	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities	Presentation, Lecture, Discussion Question/answer and reflection 2 X 50		Material: Water resource potential in general, surface, swamps, beaches and water resource potential on land. Reference: Suripin. Sustainable Urban Drainage Systems. Semarang: Andi.	3%
5	Able to understand and comprehend Water Resources Survey and Inventory, Purpose of Survey, Scope and Types of Survey	Explains the survey and inventory of water resources, the purpose of the survey, scope and types of survey	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities	Presentation, Lecture, Discussion Question/answer and reflection 2 X 50		Material: Water Resources Survey and Inventory, Purpose of Survey, Scope and Types of Survey Literature: Varshney, RM1978. Engineering Hydrology Irrigation Research Institute.	3%
6	Able to understand and comprehend several definitions of natural resources in its management	Explain the meaning of natural resources in its management	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities	Presentation, Lecture, Discussion Question/answer and reflection 2 X 50		Material: Understanding natural resources in its management. Library: Journal of Building Engineering Education Studies, FT-Unesa.	3%

7	Able to understand and identify natural resources and know the components of natural resources as water infrastructure, natural and artificial.	Identify natural resources and know the components of natural resources as water infrastructure, natural and artificial.	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities	Presentation, Lecture, Discussion Question/answer and reflection 2 X 50		Material: Natural Resources and knowing the components of Natural Resources as water infrastructure, natural and artificial. Reader: <i>Anonymous. 2015. Collection of 2015 FT-Unesa Civil Engineering Drainage Lecture Materials. Surabaya: Unipres.</i>	4%
8	UTS	UTS	Criteria: UTS Form of Assessment : Participatory Activities, Tests	UTS 2 X 50			20%
9	Able to plan the development of water resources in general, use of water resources, reservoirs, stages of water development planning and economic studies	Planning general development and utilization of water resources, reservoirs as well as planning stages for natural resource development and economic studies	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities	Presentation, Lecture, Discussion Question/answer and reflection 2 X 50		Material: Water Resources in general, Utilization of Water Resources, reservoirs, Stages of Water Development Planning and Economic Studies Reference: <i>Suripin. Sustainable Urban Drainage Systems. Semarang: Andi.</i>	3%
10	Able to plan the development of water resources, utilization of water storage dams/reservoirs.	Planning the development and utilization of dams/reservoirs for water storage.	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities	Presentation, Lecture, Discussion Question/answer and reflection 2 X 50		Material: Water Resources Development, Use of Water Storage Dams/Reservoirs. References: <i>New Delhi: Central Water & Power Commission .</i>	4%
11	Able to know Sedimentation and Erosion calculations	Explain sediment transport and its physical causes	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities	Presentation, Lecture, Discussion Question/answer and reflection 2 X 50		Material: Sedimentation and Erosion Calculations Reference: <i>Varshney, RM1978. Engineering Hydrology Irrigation Research Institute.</i>	3%
12	Able to know how to conserve water resources in general, soil and water conservation	Mentions ways to conserve water resources in general, soil and water conservation	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Practice / Performance	Online via virtual learning at https://v-learning.unesa.ac.id/course/view.php?id=2943&ion=1 2 X 50		Material: Conservation of Water Resources in general, Soil and Water Conservation Reference: <i>Kusnan. 2015. Development of a Flood Mitigation Model for the Unesa Ketintang Campus. Surabaya: Unipres.</i>	4%
13	Able to know how to deal with water pollution and flood control	Mention ways and solutions to overcome water pollution and control floods	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities	online learning via https://v-learning.unesa.ac.id/course/view.php?id=2943&ion=2 2 X 50		Material: Water pollution and flood control Reference: <i>Suripin. Sustainable Urban Drainage Systems. Semarang: Andi.</i>	4%

14	Able to know how to manage water resources in general, management concepts. Analysis of management systems and Natural Resources Management	Water resource management in general, and concept analysis of management systems and natural resource management	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities	Online via virtual learning at 2 X 50		Material: Water resource management in general, management concepts. Analysis of management systems and Natural Resources Management Library: Varshney, RM1978. Engineering Hydrology Irrigation Research Institute.	4%
15	Able to know the Water Resources Management Model, Optimizing Water Resources Management	Optimizing Water Resources Management	Criteria: Full marks are obtained if you do all the questions correctly and precisely Form of Assessment : Participatory Activities	Presentation, Lecture, Discussion Question/answer and reflection 2 X 50		Material: Water Resources Management Model, Optimization of Water Resources Management Library: New Delhi: Central Water & Power Commission.	4%
16	Master PSDA material by taking the Final Semester Examination (UAS)	UAS	Criteria: UAS Form of Assessment : Participatory Activities, Tests	UAS 2 x 50			30%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	69%
2.	Practice / Performance	4%
3.	Test	27%
		100%

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.