



**Universitas Negeri Surabaya  
Vocational Faculty,  
D4 Civil Engineering Study Program**

**Document  
Code**

**SEMESTER LEARNING PLAN**

<b>Courses</b>	<b>CODE</b>	<b>Course Family</b>	<b>Credit Weight</b>	<b>SEMESTER</b>	<b>Compilation Date</b>																																																			
ENVIRONMENTAL ENGINEERING AND AMDAL	2230503039		T=3 P=0 ECTS=4.77	5	April 28, 2023																																																			
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>	<b>Study Program Coordinator</b>																																																				
	Satriana Fitri Mustika Sari, S.T., M.T		.....	Puguh Novi Prasetyono, S.Pd., M.T.																																																				
<b>Learning model</b>	<b>Case Studies</b>																																																							
<b>Program Learning Outcomes (PLO)</b>	<b>PLO study program which is charged to the course</b>																																																							
	<b>Program Objectives (PO)</b>																																																							
	<b>PO - 1</b>	Students are able to understand UURI 32 of 2009 concerning Environmental Protection and Management, identify the nature of natural resources and how to manage/conservate them, water resources, waste management (solid and liquid).																																																						
	<b>PLO-PO Matrix</b>																																																							
		<table border="1" style="margin: auto;"> <tr><td style="padding: 5px;">P.O</td></tr> <tr><td style="padding: 5px;">PO-1</td></tr> </table>				P.O	PO-1																																																	
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	<b>PO Matrix at the end of each learning stage (Sub-PO)</b>																																																							
	<table border="1" style="margin: auto;"> <tr> <td rowspan="2" style="padding: 5px;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="padding: 5px;">1</td><td style="padding: 5px;">2</td><td style="padding: 5px;">3</td><td style="padding: 5px;">4</td><td style="padding: 5px;">5</td><td style="padding: 5px;">6</td><td style="padding: 5px;">7</td><td style="padding: 5px;">8</td><td style="padding: 5px;">9</td><td style="padding: 5px;">10</td><td style="padding: 5px;">11</td><td style="padding: 5px;">12</td><td style="padding: 5px;">13</td><td style="padding: 5px;">14</td><td style="padding: 5px;">15</td><td style="padding: 5px;">16</td> </tr> <tr> <td style="padding: 5px;">PO-1</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>					P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	PO-1																	
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PO-1																																																								
<b>Short Course Description</b>	UURI/PP/Ministry of the Environment. Clean water characteristics: physical, chemical, biological. Classification of water according to its purpose, protection of groundwater reservoirs, drinking water treatment installations (IPAM) and the function of each processing unit. Water pollution, EIA, waste water: sources and characteristics of waste water, waste water treatment plants (IPAL), the function of each domestic waste water treatment unit, the concept of environmentally friendly domestic waste water technology, septic tank design. Waste: sources and characteristics of waste, waste processing, landfill design, types, weaknesses and advantages, global warming, Amdal.																																																							
<b>References</b>	<b>Main :</b>																																																							
	<ol style="list-style-type: none"> <li>1. Asdak, Chay.2004. Hidrologi dan Pengelolaan daerah Aliran Sungai. Yogyakarta: Gadjah Mada Press.</li> <li>2. Khatuddin, Maulida. 2003. Melestarikan Sumberdaya Air dengan Teknologi rawa buatan. Yogyakarta: Gadjah Mada Press.</li> <li>3. Mahida, UN. 1984. Pencemaran Air dan pemanfaatan Limbah Industri . Jakarta: Rajawali.</li> <li>4. Soerjani, M, Ahmad R, dan Munir R. 1987. Lingkungan: Sumberdaya Alam dan Kependudukan dalam Pembangunan. Jakarta: UI Press.</li> <li>5. Sugiharto, 1987. Dasar-dasar pengelolaan Air Limbah. Jakarta: UI Press.</li> <li>6. Sumarwoto, Otto. 2004. Atur Diri Sendiri . Yogyakarta: Gadjah Mada Press.</li> <li>7. Suratmo, Gunarwan. 1990. Analisis Mengenai Dampak Lingkungan . Yogyakarta: Gadjah Mada Press.</li> <li>8. Suripin, 2001. Pelestarian Sumber Daya Tanah dan Air. Yogyakarta: Andi</li> <li>9. Tcobonoglous Goerge, Theisen Hillary, Vigit Samuel, 1993. Integrated Solid Waste Management . New York: Mc Graw Hill</li> <li>10. UU RI No 32/2009.</li> <li>11. Winanti T. 2004. Dasar-dasar Teknik Lingkungan , Buku ajar.</li> <li>12. Winanti T. 2005. Konservasi Air , Buku ajar.</li> </ol>																																																							
	<b>Supporters:</b>																																																							
<b>Supporting lecturer</b>	Dr. Ir. H. Dadang Supriyatno, M.T. Satriana Fitri Mustika Sari, S.T., M.T. Feriza Nadiar, S.T., M.T.																																																							
<b>Week</b>	<b>Final abilities of each learning stage</b>	<b>Evaluation</b>	<b>Help Learning, Learning methods, Student Assignments, [ Estimated time]</b>	<b>Learning materials</b>	<b>Assessment Weight (%)</b>																																																			

	(Sub-PO)	Indicator	Criteria & Form	Offline ( offline )	Online ( online )	[ References ]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Understand the concept map of Environmental Science material	Can explain the role of Environmental Science in Civil Engineering	<b>Criteria:</b> Perfect score if answered correctly.  <b>Form of Assessment :</b> Participatory Activities		Lectures, discussions, questions and answers, examples in the form of pictures 2 X 50 minutes	<b>Material:</b> basics of environmental science <b>Reference:</b> <i>Winanti T. 2004. Basics of Environmental Engineering, Textbook.</i>	5%
2	Understanding UURI NO 32/2009	Cognitive: Students are able to explain the boundaries of terms in the living environment. Affective: Students pay good attention to lectures. Psychomotor: Students can explain in front of the class about terms in the living environment.	<b>Criteria:</b> Perfect score if answered correctly  <b>Form of Assessment :</b> Participatory Activities, Tests		Explaining article 2 in RI Law No. 32/2009. Environmental Protection and Management 2 X 50 minutes	<b>Material:</b> Environmental Protection and Management <b>Reference:</b> <i>Republic of Indonesia Law No. 32/2009.</i>	5%
3	Understand the meaning of natural resources (SDA).	1. Students can differentiate the properties of natural resources. 2. Students are able to conceptualize how to manage natural resources 3. Understand the meaning of natural resources (natural resources).	<b>Criteria:</b> Perfect score if answered correctly  <b>Form of Assessment :</b> Participatory Activities	Lectures, discussions, observing case examples, questions and answers. 2 X 50 minutes		<b>Material:</b> Natural resources <b>References:</b> <i>Soerjani, M, Ahmad R, and Munir R. 1987. Environment: Natural Resources and Population in Development. Jakarta: UI Press.</i>	5%

4	Water as a natural resource	<ol style="list-style-type: none"> <li>1. Students can tell about the process of water availability on earth, threats and overcoming them</li> <li>2. Students can explain the existence of water, water disturbances, water threats</li> <li>3. Understand in detail the function of water in human life</li> <li>4. Understand water problems, polluted water conditions, pollutant factors</li> <li>5. Can link flood events in the rainy season with drought in the dry season.</li> <li>6. Students can explain the existence of water, water disturbances, water threats</li> </ol>	<p><b>Criteria:</b> Perfect score if answered correctly</p> <p><b>Form of Assessment :</b> Participatory Activities</p>	Lectures, discussions, observing pictures, case examples, questions and answers. 2 X 50		<p><b>Material:</b> water resources engineering <b>Reference:</b> <i>Khiatuddin, Maulida. 2003. Preserving Water Resources with Artificial Swamp Technology. Yogyakarta: Gadjah Mada Press.</i></p> <hr/> <p><b>Material:</b> conservation of water resources <b>Reference:</b> <i>Suripin, 2001. Conservation of Land and Water Resources. Yogyakarta: Andi</i></p> <hr/> <p><b>Material:</b> hydrology and river water <b>Reference:</b> <i>Asdak, Chay. 2004. Hydrology and Watershed Management. Yogyakarta: Gadjah Mada Press.</i></p> <hr/> <p><b>Material:</b> water conservation <b>Reference:</b> <i>Winanti T. 2005. Water Conservation, Textbook.</i></p>	5%
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5	Water as a natural resource	<ol style="list-style-type: none"> <li>1. Students can tell about the process of water availability on earth, threats and overcoming them</li> <li>2. Students can explain the existence of water, water disturbances, water threats</li> <li>3. Understand in detail the function of water in human life</li> <li>4. Understand water problems, polluted water conditions, pollutant factors</li> <li>5. Can link flood events in the rainy season with drought in the dry season.</li> <li>6. Students can explain the existence of water, water disturbances, water threats</li> </ol>	<p><b>Criteria:</b> Perfect score if answered correctly</p> <p><b>Form of Assessment :</b> Participatory Activities</p>	Lectures, discussions, observing pictures, case examples, questions and answers. 2 X 50 minutes		<p><b>Material:</b> water resources engineering <b>Reference:</b> <i>Khiatuddin, Maulida. 2003. Preserving Water Resources with Artificial Swamp Technology. Yogyakarta: Gadjah Mada Press.</i></p> <hr/> <p><b>Material:</b> Conservation of water resources <b>Reference:</b> <i>Suripin, 2001. Conservation of Land and Water Resources. Yogyakarta: Andi</i></p> <hr/> <p><b>Material:</b> Hydrology and river water <b>Reference:</b> <i>Asdak, Chay. 2004. Hydrology and Watershed Management. Yogyakarta: Gadjah Mada Press.</i></p> <hr/> <p><b>Material:</b> Water conservation <b>Reference:</b> <i>Winanti T. 2005. Water conservation, textbook.</i></p>	5%
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6	Water as a natural resource	<p>1. Students can tell about the process of water availability on earth, threats and overcoming them</p> <p>2. Students can explain the existence of water, water disturbances, water threats</p> <p>3. Understand in detail the function of water in human life</p> <p>4. Understand water problems, polluted water conditions, pollutant factors</p> <p>5. Can link flood events in the rainy season with drought in the dry season.</p> <p>6. Students can explain the existence of water, water disturbances, water threats</p>	<p><b>Criteria:</b> Perfect score if answered correctly</p> <p><b>Form of Assessment :</b> Participatory Activities</p>	Lectures, discussions, observing pictures, case examples, questions and answers. 2 X 50		<p><b>Material:</b> water resources engineering <b>Reference:</b> <i>Khiatuddin, Maulida. 2003. Preserving Water Resources with Artificial Swamp Technology. Yogyakarta: Gadjah Mada Press.</i></p> <p><b>Material:</b> Conservation of water resources <b>Reference:</b> <i>Suripin, 2001. Conservation of Land and Water Resources. Yogyakarta: Andi</i></p> <p><b>Material:</b> hydrology and river water <b>Reference:</b> <i>Asdak, Chay. 2004. Hydrology and Watershed Management. Yogyakarta: Gadjah Mada Press.</i></p> <p><b>Material:</b> water conservation <b>Reference:</b> <i>Winanti T. 2005. Water Conservation, Textbook.</i></p>	5%
7	Floods, droughts, mitigation, conservation	Students can relate flood events in the rainy season to droughts in the dry season.	<p><b>Criteria:</b> Perfect score if answered correctly</p>	Lectures, discussions, exercises to reveal cases around 2 X 50			5%
8	UTS	-	<p><b>Criteria:</b> -</p> <p><b>Form of Assessment :</b> Test</p>	- 2 X 50			15%
9	Waste	Understand waste: solid, liquid, gas. Sources, events and consequences.	<p><b>Criteria:</b> Perfect score if answered correctly</p> <p><b>Form of Assessment :</b> Participatory Activities</p>	Lectures, discussions, questions and answers, case examples. 2 X 50		<p><b>Material:</b> Definition of waste. Waste group. <b>References:</b> <i>Tcobonoglous Goerge, Theisen Hillary, Vigit Samuel, 1993. Integrated Solid Waste Management. New York: McGraw Hill</i></p> <p><b>Material:</b> Sources, events and consequences. <b>References:</b> <i>Sugiharto, 1987. Basics of Waste Water Management. Jakarta: UI Press.</i></p>	5%

10	Solid waste and several alternative ways to deal with it.	Understand the limits of waste, sources of waste and the impact of waste generation, and the use of waste that has value	<b>Criteria:</b> Perfect score if answered correctly  <b>Form of Assessment :</b> Participatory Activities, Tests	Lectures, discussions, questions and answers, case examples. 2 X 50		<b>Material:</b> Waste: sources of waste, types of waste, the problems they cause, and current conditions. <b>References:</b> <i>Tcobonoglous Goerge, Theisen Hillary, Vigit Samuel, 1993. Integrated Solid Waste Management. New York: McGraw Hill</i>  <b>Material:</b> Processing waste into useful items <b>Reference:</b> <i>Mahida, UN. 1984. Water Pollution and Use of Industrial Waste. Jakarta: Rajawali.</i>	5%
11	Liquid waste.	Students can understand the dangers of liquid waste, sources, threats and how to deal with them	<b>Criteria:</b> Perfect score if answered correctly	Lectures, discussions, questions and answers, case examples. 2 X 50		<b>Material:</b> Liquid waste, definition and sources <b>Reference:</b> <i>Mahida, UN. 1984. Water Pollution and Use of Industrial Waste. Jakarta: Rajawali.</i>  <b>Material:</b> Management techniques <b>Reference:</b> <i>Sugiharto, 1987. Basics of Waste Water Management. Jakarta: UI Press.</i>	5%

12	Liquid waste processing, household scale, residential area/shop/market/restaurant scale, industry.	Students can explain demonstratively ways to manage liquid waste.	<p><b>Criteria:</b> Perfect score if answered correctly</p> <p><b>Forms of Assessment :</b> Participatory Activities, Portfolio Assessment, Practice / Performance</p>	Lectures, discussions, questions and answers, case examples. 2 X 50		<p><b>Material:</b> Field overview of waste and liquid waste processing. <b>References:</b> Mahida, UN. 1984. <i>Water Pollution and Use of Industrial Waste</i>. Jakarta: Rajawali.</p> <hr/> <p><b>Material:</b> Planning liquid waste processing. <b>References:</b> Mahida, UN. 1984. <i>Water Pollution and Use of Industrial Waste</i>. Jakarta: Rajawali.</p> <hr/> <p><b>Material:</b> Household liquid waste processing <b>Reference:</b> Sugiharto, 1987. <i>Basics of Waste Water Management</i>. Jakarta: UI Press.</p> <hr/> <p><b>Material:</b> How to process household liquid waste &amp; its calculations <b>Reference:</b> Sugiharto, 1987. <i>Basics of waste water management</i>. Jakarta: UI Press.</p>	5%
13	Global warming	Students can explain the occurrence of global warming, its causes and mitigation	<p><b>Criteria:</b> Perfect score if answered correctly</p> <p><b>Form of Assessment :</b> Participatory Activities</p>	Lectures, discussions, questions and answers, case examples. 2 X 50		<p><b>Material:</b> Global Warming <b>References:</b> Soerjani, M, Ahmad R, and Munir R. 1987. <i>Environment: Natural Resources and Population in Development</i>. Jakarta: UI Press.</p>	5%
14	Amdal	Students understand the importance of Amdal, when an Amdal must be carried out, the steps in carrying out an Amdal	<p><b>Criteria:</b> Perfect score if answered correctly</p> <p><b>Form of Assessment :</b> Participatory Activities, Portfolio Assessment</p>	Lectures, questions and answers, 2 case examples. 2 X 50		<p><b>Material:</b> Role of Amdal, Actors of Amdal, Implementation of Amdal in accordance with Law 32/2009 <b>References:</b> Suratmo, Gunarwan. 1990. <i>Environmental Impact Analysis</i>. Yogyakarta: Gadjah Mada Press.</p>	5%

15	Paper presentation	Students can prepare papers and present them	<b>Criteria:</b> Perfect score if answered correctly  <b>Form of Assessment :</b> Portfolio Assessment	Students present one by one 2 X 50			10%
16			<b>Form of Assessment :</b> Test	offline 2 X 50			20%

#### Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	44.17%
2.	Portfolio Assessment	14.17%
3.	Practice / Performance	1.67%
4.	Test	40%
		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.