



**Universitas Negeri Surabaya  
Faculty of Engineering  
Civil Engineering Undergraduate 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>																																																																																																																					
<b>ROAD AND BRIDGE DESIGN</b>	2220101183	Compulsory Study Program Subjects	<b>T=1</b>	<b>P=0</b>	<b>ECTS=1.59</b>	4	August 9, 2022																																																																																																																					
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>			<b>Study Program Coordinator</b>																																																																																																																						
	Suprpto, S.Pd., M.T. ; Meity Wulandari, S.T., M.T. ; Mochamad Firmansyah Sofianto, S.T., M.Sc., M.T. ; Purwo Mahardi, S.T., M.Sc. dan 2 lainnya		-			Yogie Risdianto, S.T., M.T.																																																																																																																						
<b>Learning model</b>	<b>Project Based Learning</b>																																																																																																																											
<b>Program Learning Outcomes (PLO)</b>	<b>PLO study program that is charged to the course</b>																																																																																																																											
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	<b>PO - 1</b>	Students are able to plan the floor of a bridge vehicle																																																																																																																										
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	<b>PLO-PO Matrix</b>																																																																																																																											
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<b>PO Matrix at the end of each learning stage (Sub-PO)</b>																																																																																																																												
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<b>Short Course Description</b>	Bridge concept, bridge types, bridge classification, bridge planning stages, understanding steel bridges, types of steel bridges, bridge loading, bridge vehicle floor planning, girder beam planning, composite bridge planning, bridge pillar planning, bridge foundation planning																																																																																																																											
<b>References</b>	<b>Main :</b>																																																																																																																											

1. Supriyadi, B, 1997, Analisis Struktur Jembatan, Biro Penerbit KMTS FT UGM Yogyakarta.
2. Anonim, 1987, Pedoman Pembebanan Jembatan Jalan Raya, Yayasan Badan Penerbit PU, Jakarta
3. Barker, M.R, A.J, 1997, Design of Highway Bridges: Based on AASHTO LRFD Bridges Design Specification, John Wiley & Sons, Inc, New York, USA
4. Nawy, E.G. 1996, Prestressed Concrete: Fundamental, Prentice Hall, New Gersy Australia.
5. Anonim. SNI 1725 – 2016 Pembebanan Untuk Jembatan. BSN.
6. Anonim. SNI 2833 – 2016 Perencanaan Jembatan Terhadap Beban Gempa. BSN
7. Anonim. RSNI T-03-2005 Standar perencanaan struktur baja untuk jembatan. BSN.
8. Anonim. RSNI T-12-2004 Standar perencanaan struktur beton untuk jembatan. BSN.

**Supporters:**

**Supporting lecturer**  
 Yogie Risdianto, S.T., M.T.  
 Abdiyah Amudi, S.T., M.T.  
 Irfan Prasetyo Loekito, S.T., M.Sc.  
 Alwan Gangsar Brilian Putra, S.Tr.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	Explain the meaning of bridge types and classifications as well as bridge design stages	<ol style="list-style-type: none"> <li>1.Explain several bridge concepts</li> <li>2.Explain the mechanisms of bridge design stages</li> <li>3.Explain orally the concept of a bridge</li> <li>4.Explain verbally the mechanisms of bridge design stages</li> </ol>	<p><b>Criteria:</b> Full marks are obtained if you can do all the questions correctly</p> <p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<p><b>Material:</b> understanding of types and classification of bridges and stages of bridge design. <b>Reference:</b> <i>Supriyadi, B, 1997, Bridge Structure Analysis, KMTS FT UGM Yogyakarta Publishing Bureau.</i></p> <p><b>Material:</b> understanding of types and classification of bridges and stages of bridge design <b>Reference:</b> <i>Anonymous, 1987, Guidelines for Loading Highway Bridges, Public Works Publishing Agency Foundation, Jakarta</i></p>	6%

2	Explain the types of steel bridges.	<ol style="list-style-type: none"> <li>1.Explain the meaning of a steel bridge</li> <li>2.Explain the types of steel bridges</li> <li>3.Explain verbally the meaning of a steel bridge</li> <li>4.Explain orally the types of steel bridges</li> </ol>	<p><b>Criteria:</b> Full marks are obtained if you can do all the questions correctly</p> <p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<p><b>Material:</b> Types of steel bridges <b>Reference:</b> <i>Supriyadi, B, 1997, Bridge Structure Analysis, KMTS FT UGM Yogyakarta Publishing Bureau.</i></p> <hr/> <p><b>Material:</b> Types of steel bridges <b>Reference:</b> <i>Anonymous, 1987, Guidelines for Loading Jalan Raya Bridges, Public Works Publishing Agency Foundation, Jakarta</i></p>	6%
3	Explain the types of loads on bridges	<ol style="list-style-type: none"> <li>1.Explain the meaning of bridge load</li> <li>2.Explain the various types of bridge loads</li> <li>3.Explain the combination of bridge loads</li> <li>4.Explain verbally the meaning of bridge load</li> <li>5.Explain verbally the various types of bridge loads</li> </ol>	<p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<p><b>Material:</b> Types of loads on bridges <b>Reference:</b> <i>Anonymous. SNI 1725 – 2016 Loading for Bridges. BSN.</i></p>	6%
4	Explain the types of loads on bridges	<ol style="list-style-type: none"> <li>1.Explain the meaning of bridge load</li> <li>2.Explain the various types of bridge loads</li> <li>3.Explain the combination of bridge loads</li> <li>4.Explain verbally the meaning of bridge load</li> <li>5.Explain verbally the various types of bridge loads</li> </ol>	<p><b>Criteria:</b> Full marks are obtained if you can do all the questions correctly</p> <p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<p><b>Material:</b> Types of loads on bridges <b>Reference:</b> <i>Supriyadi, B, 1997, Bridge Structure Analysis, KMTS FT UGM Yogyakarta Publishing Bureau.</i></p>	6%

5	Plan the vehicle floor	<ol style="list-style-type: none"> <li>1.Explain the stages of vehicle floor planning</li> <li>2.Explain the types of loads acting on the vehicle floor</li> <li>3.Calculate the moment acting on the floor of the vehicle</li> <li>4.Explains the combination of vehicle floor moments</li> <li>5.Planning bridge floor reinforcement</li> <li>6.Explain verbally the stages of planning a bridge floor</li> </ol>	<p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<p><b>Material:</b> Vehicle floors <b>Reference:</b> <i>Anonymous, 1987, Guidelines for Loading Highway Bridges, Public Works Publishing Agency Foundation, Jakarta</i></p> <hr/> <p><b>Material:</b> Vehicle floor <b>Reference:</b> <i>Anonymous. SNI 1725 – 2016 Loading for Bridges. BSN.</i></p>	6%
6	Plan the vehicle floor	<ol style="list-style-type: none"> <li>1.Explain the stages of vehicle floor planning</li> <li>2.Explain the types of loads acting on the vehicle floor</li> <li>3.Calculate the moment acting on the floor of the vehicle</li> <li>4.Explains the combination of vehicle floor moments</li> <li>5.Planning bridge floor reinforcement</li> <li>6.Explain verbally the stages of planning a bridge floor</li> </ol>	<p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<p><b>Material:</b> Vehicle floor <b>Reference:</b> <i>Anonymous. SNI 1725 – 2016 Loading for Bridges. BSN.</i></p> <hr/> <p><b>Material:</b> Vehicle floor <b>Reference:</b> <i>Supriyadi, B, 1997, Bridge Structural Analysis, KMTS FT UGM Yogyakarta Publishing Bureau.</i></p>	6%
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8	UTS		<b>Form of Assessment :</b> Project Results Assessment / Product Assessment	2 X 50			6%
9	Planning girder beams	<ol style="list-style-type: none"> <li>1.Explain the stages of girder beam planning</li> <li>2.Explain the loading of girder beams</li> <li>3.Explain the calculation of moments in girder beams</li> <li>4.Planning the strength of girder beams</li> <li>5.Explain verbally the planning of girder beams</li> </ol>	<b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<b>Material:</b> Girder beams <b>Reference:</b> Anonymous. SNI 1725 – 2016 Loading for Bridges. BSN. <hr/> <b>Material:</b> Girder beams <b>Reference:</b> Anonymous. SNI 2833 – 2016 Bridge Planning Against Earthquake Loads. BSN	6%
10	Planning girder beams	<ol style="list-style-type: none"> <li>1.Explain the stages of girder beam planning</li> <li>2.Explain the loading of girder beams</li> <li>3.Explain the calculation of moments in girder beams</li> <li>4.Planning the strength of girder beams</li> <li>5.Explain verbally the planning of girder beams</li> </ol>	<b>Criteria:</b> Full marks are obtained if you can do all the questions correctly  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<b>Material:</b> Girder beams <b>References:</b> Barker, MR, AJ, 1997, Design of Highway Bridges: Based on AASHATO LRFD Bridges Design Specification, John Wiley & Sons, Inc, New York, USA	6%
11	Composite bridge planning	<ol style="list-style-type: none"> <li>1.Explain the stages of composite bridge planning</li> <li>2.Explain the loading of composite bridges</li> <li>3.Explain the calculation of moments in composite bridges</li> <li>4.Analyzing composite bridge strength planning</li> <li>5.Explain orally the planning of a composite bridge</li> </ol>	<b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<b>Material:</b> composite bridge <b>Reference:</b> Anonymous. SNI 1725 – 2016 Loading for Bridges. BSN. <hr/> <b>Material:</b> composite bridge <b>Reference:</b> Anonymous. RSNI T-12-2004 Standard for planning concrete structures for bridges. BSN. <hr/> <b>Material:</b> composite bridge <b>Reference:</b> Anonymous. RSNI T-03-2005 Standard for planning steel structures for bridges. BSN.	6%

12	Analyzing composite bridge planning	<ol style="list-style-type: none"> <li>1.Explain the stages of composite bridge planning</li> <li>2.Explain the loading of composite bridges</li> <li>3.Explain the calculation of moments in composite bridges</li> <li>4.Planning the strength of composite bridges</li> <li>5.Explain orally the planning of a composite bridge</li> </ol>	<p><b>Criteria:</b> Full marks are obtained if you can do all the questions correctly</p> <p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<p><b>Material:</b> composite bridge</p> <p><b>Reference:</b> <i>Anonymous. RSNi T-03-2005</i> <i>Standard for planning steel structures for bridges. BSN.</i></p> <hr/> <p><b>Material:</b> composite bridge</p> <p><b>Reference:</b> <i>Anonymous. RSNi T-12-2004</i> <i>Standard for planning concrete structures for bridges. BSN.</i></p>	6%
13	Analyzing bridge pillar planning	<ol style="list-style-type: none"> <li>1.Explain the stages of planning bridge pillars</li> <li>2.Explain the loading of bridge pillars</li> <li>3.Explain the calculation of moments on bridge pillars</li> <li>4.Planning the strength of composite bridges</li> <li>5.Explain orally the planning of bridge pillars</li> </ol>	<p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<p><b>Material:</b> bridge pillar planning</p> <p><b>Reference:</b> <i>Anonymous. RSNi T-12-2004</i> <i>Standard for planning concrete structures for bridges. BSN.</i></p>	6%
14	Planning bridge pillars	<ol style="list-style-type: none"> <li>1.Explain the stages of planning bridge pillars</li> <li>2.Explain the loading of bridge pillars</li> <li>3.Explain the calculation of moments on bridge pillars</li> <li>4.Planning the strength of composite bridges</li> <li>5.Explain orally the planning of bridge pillars</li> </ol>	<p><b>Criteria:</b> Full marks are obtained if you can do all the questions correctly</p> <p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<p><b>Material:</b> bridge pillar planning</p> <p><b>Reference:</b> <i>Anonymous. RSNi T-03-2005</i> <i>Standard for planning steel structures for bridges. BSN.</i></p> <hr/> <p><b>Material:</b> bridge pillar planning</p> <p><b>Reference:</b> <i>Anonymous. RSNi T-12-2004</i> <i>Standard for planning concrete structures for bridges. BSN.</i></p>	6%

15	Planning bridge foundations	<ol style="list-style-type: none"> <li>1.Explain the stages of bridge foundation planning</li> <li>2.Explain the loading of bridge foundations</li> <li>3.Explain the calculation of moments in bridge foundations</li> <li>4.Planning the strength of bridge foundations</li> <li>5.Explain orally the planning of bridge foundations</li> </ol>	<b>Criteria:</b> Full marks are obtained if you can do all the questions correctly  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Collaborative Learning Approach (Discussion lecture and question and answer) 2 X 50		<b>Material:</b> bridge foundations <b>Reference:</b> <i>Supriyadi, B, 1997, Bridge Structural Analysis, KMTS FT UGM Yogyakarta Publishing Bureau.</i>	6%
16			<b>Form of Assessment :</b> Project Results Assessment / Product Assessment				10%

#### Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Project Results Assessment / Product Assessment	100%
		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.