



**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>																																																																																																																						
Road Geometry	2220102016	Compulsory Study Program Subjects	T=2	P=0	ECTS=3.18	3	July 17, 2024																																																																																																																						
<b>AUTHORIZATION</b>		<b>SP Developer</b>	<b>Course Cluster Coordinator</b>			<b>Study Program Coordinator</b>																																																																																																																							
		.....	.....			Yogie Risdianto, S.T., 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 have the ability to conduct traffic volume surveys on highways honestly and responsibly in order to obtain traffic volume and characteristics data.																																																																																																																											
	<b>PO - 2</b>	Students have knowledge about the application of land surveying in its application for intelligent and responsible highway geometric planning																																																																																																																											
	<b>PO - 3</b>	Students have full knowledge of the geometric planning characteristics of highways in various locations and curve shapes																																																																																																																											
	<b>PO - 4</b>	Students have the ability to plan highway geometrics according to road classification and care about K3 and the environment																																																																																																																											
	<b>PO - 5</b>	Students have the ability to intelligently plan road geometrics that can be used efficiently, safely, comfortably and smoothly by vehicle drivers																																																																																																																											
	<b>PLO-PO Matrix</b>																																																																																																																												
		<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> <tr><td>PO-5</td></tr> </table>	P.O	PO-1	PO-2	PO-3	PO-4	PO-5																																																																																																																					
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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>	Learn about trace measurements for new road routes and road improvements, transportation infrastructure and facilities, highway transport legislation, highway standards and benefits, highway classification, highway cross-sections, vehicles: types of vehicles, visibility. Highway geometric planning: Highway geometric planning criteria, horizontal alignment and vertical alignment, combined alignment.																																																																																																																												
<b>References</b>	<b>Main :</b>																																																																																																																												
	<ol style="list-style-type: none"> <li>1. AASHTO. 1984. A Policy on Geometric Design of Highways and Streets. Washington DC: AASHTO.</li> <li>2. Anonim. 1970. Peraturan Perencanaan Geometrik Jalan Raya. Jakarta: Dirjen Bina Marga.</li> <li>3. Anonim. 1997. Manual dan Kapasitas Jalan Indonesia (MKJI).</li> <li>4. Institution of Highways and Transportation with The Department of Transport.</li> <li>5. Sukirman, Silvia. 1994. Dasar-Dasar Perencanaan Geometrik Jalan. Bandung: Nova.</li> <li>6. Oglesby, CH., Hicks, RG. 1982. Highway Engineering. Singapore: John Wiley &amp; Sons.</li> <li>7. Soeparno, 2009. Geometrik Jalan Raya. JTS FT Unesa.</li> <li>8. Hendarsin, S.L. 2000. Perencanaan Teknik Jalan Raya. Bandung: JTS, Politeknik Negeri Bandung.</li> <li>9. Undang Undang Republik Indonesia No. 38 Tahun 2004.</li> <li>10. Kementerian Perhubungan. 2014. Pedoman Kapasitas Jalan Indonesia.</li> </ol>																																																																																																																												
	<b>Supporters:</b>																																																																																																																												
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<b>Supporting lecturer</b>	Dr. Ari Widayanti, S.T., M.T. Purwo Mahardi, S.T., M.Sc. Abdiyah Amudi, 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 understand the concept and meaning and history of Highways in general.	1.Explain the meaning of roads in general. 2.Tells about the history of the highway 3.Explain the objectives of geometric road planning. 4.Explain the geometric function of highway planning.	<b>Criteria:</b> Understand the material well  <b>Form of Assessment :</b> Participatory Activities	Presentations, questions and answers, discussions and reflections. 2 X 50 project based field study		<b>Material:</b> understanding of highways in general, history of highways, purpose and function of Highway Geometrics. <b>Bibliography:</b> Sukirman, Silvia. 1994. <i>Basics of Geometric Road Planning</i> . Bandung: Nova.	4%
2	Students understand Road Classification in accordance with regulations and legislation	1.Explain the classification of highways according to applicable laws and regulations. 2.Explain the classification according to highway class.	<b>Criteria:</b> Understand the material well.  <b>Form of Assessment :</b> Participatory Activities	Presentations, questions and answers, discussions and reflections. 2 X 50 project based field study		<b>Material:</b> Road classification in accordance with applicable regulations and legislation. <b>References:</b> <i>Law of the Republic of Indonesia no. 38 of 2004.</i>	4%
3	Students understand Road Classification in accordance with regulations and legislation	1.Explain the Road Network System 2.Explain the classification of roads according to criteria in accordance with applicable laws and regulations.	<b>Criteria:</b> Understand the material well  <b>Form of Assessment :</b> Participatory Activities	Presentations, questions and answers, discussions and reflections. 2 X 50 project based field study		<b>Material:</b> Road network system, road classification according to applicable statutory and regulatory criteria. <b>References:</b> <i>Law of the Republic of Indonesia no. 38 of 2004.</i>	4%
4	Highway Geometric Planning Criteria	1.Explain the considerations in geometric planning of highways. 2.Explains standards and planned vehicle groups. 3.Explain the composition/characteristics of traffic.	<b>Criteria:</b> Understand the material well  <b>Form of Assessment :</b> Participatory Activities	Presentations, questions and answers, discussions and reflections. 2 X 50		<b>Material:</b> Considerations in highway geometric planning, standards and planned vehicle groups, traffic composition/characteristics. <b>Reader:</b> Anonymous. 1997. <i>Manual and Capacity of Indonesian Roads (MKJI)</i> .  <b>Material:</b> Considerations in highway geometric planning, standards and planned vehicle groups, traffic composition/characteristics. <b>References:</b> <i>Ministry of Transportation. 2014. Guidelines for Indonesian Road Capacity.</i>	3%
5	Highway Geometric Planning Criteria	1.Explain about passenger car units (SMP) and passenger car equivalents (EMP) 2.Explains the Volume and Capacity of road traffic. 3.Explaining the Level of Service (LOS) of Highways	<b>Criteria:</b> Understand the material well  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentations, questions and answers, discussions and reflections. 2 X 50		<b>Material:</b> Passenger car units (smp), and passenger car equivalents (emp), road traffic volume and capacity, Highway Level of Service (LOS). <b>Reader:</b> Anonymous. 1997. <i>Manual and Capacity of Indonesian Roads (MKJI)</i> .  <b>Material:</b> Passenger car units (smp), and passenger car equivalents (emp), road traffic volume and capacity, Highway Level of Service (LOS). <b>References:</b> <i>Ministry of Transportation. 2014. Guidelines for Indonesian Road Capacity.</i>	4%
6	Able to explain viewing distance	1.Can define viewing distance. 2.Explain the factors that influence visibility on straight roads. 3.Describe visibility at road curves.	<b>Criteria:</b> Understand the material well.  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentations, questions and answers, discussions and reflections. 2 X 50 project based field study		<b>Material:</b> Visibility, factors that influence visibility on straight roads, visibility on road curves. <b>Bibliography:</b> Sukirman, Silvia. 1994. <i>Basics of Geometric Road Planning</i> . Bandung: Nova.	4%

7	Able to explain horizontal alignment in highway geometric planning.	1.Explain in general about Horizontal alignment 2.Explains 3 (three) types of Bends: 1). FC, 2). SCS., 3) SS, in highway alignment planning 3.Explaining transition curves in types of curves	<b>Criteria:</b> Understand the material well  <b>Form of Assessment :</b> Participatory Activities	Presentations, questions and answers, discussions and reflections. 2 X 50 project based field study	<b>Material:</b> Types of Bends: 1). FC, 2). SCS., 3) SS, in highway alignment planning <b>Reference:</b> Anonymous. 1970. Highway Geometric Planning Regulations. Jakarta: Director General of Highways.  <b>Material:</b> Transitional Curves in Types of Curves <b>Reference:</b> Anonymous. 1970. Highway Geometric Planning Regulations. Jakarta: Director General of Highways.	4%
8	Able to explain horizontal alignment in highway geometric planning.	1.Explains about super elevation at highway bends 2.Explain about widening the road at the corner 3.Discuss examples of Horizontal Alignment planning questions	<b>Criteria:</b> Understand the material well  <b>Form of Assessment :</b> Participatory Activities, Tests	Presentations, questions and answers, discussions and reflections. 2 X 50 project based field study		20%
9	1.Define road grade 2.Explaining Relative Ramps on highways	Understand the material well	<b>Criteria:</b> -  <b>Form of Assessment :</b> Participatory Activities	Presentations, questions and answers, discussions and reflections. 2 X 50 project based field study	<b>Material:</b> Road grade <b>Reference:</b> Anonymous. 1970. Highway Geometric Planning Regulations. Jakarta: Director General of Highways.  <b>Material:</b> Relative ramps on highways <b>Reference:</b> Anonymous. 1970. Highway Geometric Planning Regulations. Jakarta: Director General of Highways.	4%
10	Able to explain the slope of the highway	1.Define road grade 2.Explaining Relative Ramps on highways 3.Explains vehicle characteristics, maximum and minimum slopes and critical length of slopes 4.Explain the climbing lane on the highway.	<b>Criteria:</b> Understand the material well  <b>Form of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment	Presentations, questions and answers, discussions and reflections. 2 X 50 project based field study	<b>Material:</b> Vehicle characteristics, maximum and minimum slopes and critical slope lengths <b>Reference:</b> Anonymous. 1970. Highway Geometric Planning Regulations. Jakarta: Director General of Highways.  <b>Material:</b> Climbing lanes on highways <b>Reference:</b> Anonymous. 1970. Highway Geometric Planning Regulations. Jakarta: Director General of Highways.	4%
11	Able to explain Vertical Alignment	1.Defining Vertical Alignment in general 2.Explaining Convex Vertical Curves on Highways	<b>Criteria:</b> Understand the material well  <b>Form of Assessment :</b> Participatory Activities	Presentations, questions and answers, discussions and reflections. And task 2 X 50	<b>Material:</b> General Vertical Alignment <b>Reference:</b> Soeparno, 2009. Highway Geometrics. JTS FT Unesa.  <b>Material:</b> Convex Vertical Curves in Highways <b>Reference:</b> Soeparno, 2009. Highway Geometrics. JTS FT Unesa.	4%
12	Able to explain Vertical Alignment	1.Explaining Concave Vertical Curves in Highways 2.Discuss examples of questions regarding Vertical Curve planning	<b>Criteria:</b> Understand the material well  <b>Form of Assessment :</b> Participatory Activities	Presentations, questions and answers, discussions and reflections. And task 2 X 50	<b>Material:</b> Concave Vertical Curves in Highways <b>Reference:</b> Soeparno, 2009. Highway Geometrics. JTS FT Unesa.	4%
13	Able to explain Super Elevation Diagrams around corners	1.Defining Super elevation diagrams in general 2.Explains the method for achieving Super elevation	<b>Criteria:</b> Understand the material well  <b>Form of Assessment :</b> Participatory Activities	Presentations, questions and answers, group discussions and reflections. 2 X 50 project based field study	<b>Material:</b> Super elevation diagram in general. <b>Reference:</b> Anonymous. 1970. Highway Geometric Planning Regulations. Jakarta: Director General of Highways.  <b>Material:</b> Method of achieving Super elevation <b>Reference:</b> Anonymous. 1970. Highway Geometric Planning Regulations. Jakarta: Director General of Highways.	4%

14	Combined Bends and Alignment Coordination Alignment Coordination	1. Defines Joint Bends and Alignment Coordination in general 2. Explain about one-way combined bends on highways	<b>Criteria:</b> Understand the material well  <b>Form of Assessment :</b> Participatory Activities	Presentations, questions and answers, discussions and reflections. 2 X 50 project based field study		<b>Material:</b> Joint Bends and Alignment Coordination in general <b>Reference:</b> Anonymous. 1970. Highway Geometric Planning Regulations. Jakarta: Director General of Highways.  <b>Material:</b> Unidirectional combined bends on highways <b>Reference:</b> Soeparno, 2009. Highway Geometrics. JTS FT Unesa.	3%
15	Combined Bends and Alignment Coordination Alignment Coordination	1. Explains the combined U-turn curve on the highway 2. Explain the conditions for combining several horizontal and vertical alignment elements and cross sections	<b>Criteria:</b> Understand the material well	Presentations, questions and answers, discussions and reflections. 2 X 50 project based field study		<b>Material:</b> Combined U-Turn on the highway <b>Reference:</b> Anonymous. 1970. Highway Geometric Planning Regulations. Jakarta: Director General of Highways.  <b>Material:</b> Requirements for combining several horizontal and vertical alignment elements and cross sections <b>Reference:</b> Soeparno, 2009. Highway Geometrics. JTS FT Unesa.	3%
16	Final exams		<b>Form of Assessment :</b> Participatory Activities, Tests				30%

#### Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	65%
2.	Project Results Assessment / Product Assessment	10%
3.	Test	25%
		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** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities 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.