



UNIVERSITAS PENDIDIKAN INDONESIA

SEMESTER LEARNING PLAN (RPS)

COURSE IDENTITY

Course Name	Course Code	Sks	Workload	Course Group	Semester	Prerequisite Course	Publication Date
REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEMS FOR TRANSPORTATION	SA540	2	90	Advanced Course	2		2025-09-09 11:26:56

Prepared by	Reviewed by	Approved by
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COURSE DESCRIPTION AND GRADUATE LEARNING OUTCOMES

Course Description	This course is an advanced course for students of the Geographic Information Science Study Program that examines the acquisition of transportation parameters through remote sensing and Geographic Information Systems (GIS), along with the analysis and visualization of transportation information. Students will study how this technology is applied for monitoring transportation infrastructure, analyzing traffic conditions, route planning, and mitigating the environmental impacts of transportation.		
Graduate Learning Outcomes	1	Possess a sound understanding of the concepts and implementation of remote sensing and GIS for transportation. (KN: Knowledge, GS: General Skills, SS: Specific Skills)	
	2	Capable of identifying the parameters required to solve problems using a spatial approach. (KN)	
	3	Capable of conducting observations, measurements, and field data collection to support problem-solving. (GS)	
	4	Skilled in using remote sensing and GIS software for transportation. (SS)	
	5	Capable of presenting data from measurements and analysis as information that is easily understood. (SS)	
Course Learning Outcomes (CPMK)	1	Students are able to master the fundamental concepts of RS and GIS for Transportation (GLO 1 and GLO 2).	
	2	Students are able to conduct observations and apply spatial information data for transportation using remote sensing and GIS for various applications (GLO 3).	
	3	Students are able to process RS and GIS data for Transportation using software (GLO 4).	
	4	Students are able to present and analyze RS and GIS data for Transportation (GLO 5).	
Sub-CPMK	1	CPMK - 1	Students are able to understand the definition, general overview, and parameters of Remote Sensing and GIS for Transportation (Taxonomy Level 1).
	2	CPMK - 2	Students are able to apply the utilization of Remote Sensing and GIS for Transportation (Taxonomy Levels 3 and 4).
	3	CPMK - 3	Students are able to utilize software for the processing of Remote Sensing and GIS data for Transportation (Taxonomy Level 6).
	4	CPMK - 4	Students are able to present RS and GIS data for Transportation and analyze them for various purposes (Taxonomy Levels 4, 5, and 6).
Course Materials	1	Introduction to RS and GIS for Transportation	
	2	Concepts and Components of GIS for Transportation (GIS-T)	
	3	Identification of Road Damage using High-Resolution Imagery	
	4	Analysis of Traffic Conditions using Multi-Temporal Imagery	
	5	Analysis of Carbon Emissions from Vehicles Based on Spatial Data	

	6	Traffic Accident Modeling Based on Spatial Data
	7	Mass Transit Route Planning using Network Analyst
	8	Midterm Examination (UTS)
	9	Population Movement Patterns and Vehicle Volume Distribution
	10	Integration of GIS with Real-Time Data in Transportation (Bus, Railway)
	11	Toll Road Route Planning
	12	Origin-Destination Matrix Analysis
	13	Network Analyst Facilities
	14	Logistics and Goods Distribution Optimization with GIS
	15	Practicum on Transportation Network Analysis using GIS
	16	Final Examination (UAS)
Demonstrable Learning Outcomes at the End of the Course*)	Upon completing this course, students are expected to gain practical experience in geospatial data-based spatial analysis to support decision-making in the transportation sector.	
Learning Strategy	✓	Case Method
		Team based Project
		Others
Learning Steps	The Remote Sensing and GIS for Transportation course consists of both theoretical and practicum components. The methods employed include lectures, question-and-answer sessions, assignments, practicum sessions, and projects. Assignments given take the form of subject matter deepening and case studies (case method) conducted individually and in groups. Evaluations consist of practicum reports, a midterm examination, a final examination, and a project.	
References	1	Thill, J. C. (2000). Geographic information systems for transportation in perspective. Transportation Research Part C: Emerging Technologies, 8(1-6), 3-12.
	2	Goodchild, M. F. (2000). GIS and transportation: status and challenges. GeoInformatica, 4, 127-139
	3	Niemeier, D. A., & Beard, M. K. (1993). GIS and transportation planning: A case study. Computers, environment and urban systems, 17(1), 31-43. Niemeier, D. A., & Beard, M. K. (1993). GIS and transportation planning: A case study. Computers, environment and urban systems, 17(1), 31-43.

LEARNING PLAN

Week	Sub-CPMK	Sub-CLO Achievement Indicators Demonstrable by Students	Course Material	Assessment		Learning Form and Method		Duration(mi n)	Ref.No.	AccessTime
				Assessment Form(test /non-test)	Weight(%)	Synchronous(Face-to-Face& Online)	Asynchronous (Individual &Group Tasks)			
1	Students are able to understand the meaning, general description and parameters of Remote Sensing and GIS for Transportation (Taxonomy 1)	Students are able to understand the definition, general overview, and parameters of Remote Sensing and GIS for Transportation.	Introduction to RS and GIS for Transportation	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	1	03-02-2025 08:00
2	Students are able to understand the meaning, general description and parameters of Remote Sensing and GIS for Transportation (Taxonomy 1)	Students are able to understand the definition, general overview, and parameters of Remote Sensing and GIS for Transportation.	Concepts and Components of GIS for Transportation (GIS-T)	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	1	10-02-2025 08:00
3	Students are able to apply the use of Remote Sensing and GIS for Transportation (Taxonomy 3 and 4)	Students are able to apply the utilization of Remote Sensing and GIS for Transportation.	Identification of Road Damage using High-Resolution Imagery	Multiple Choice	5	Face-to-face	Search for sources relevant to the course	2 x 50	2	17-02-2025 08:00
4	Students are able to apply the use of Remote Sensing and GIS for Transportation (Taxonomy 3 and 4)	Students are able to apply the utilization of Remote Sensing and GIS for Transportation.	Analysis of Traffic Conditions using Multi-Temporal Imagery	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	2	24-02-2025 08:00
5	Students are able to apply the use of Remote Sensing and GIS for Transportation (Taxonomy 3 and 4)	Students are able to apply the utilization of Remote Sensing and GIS for Transportation.	Analysis of Carbon Emissions from Vehicles Based on Spatial Data	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	3	03-03-2025 08:00

Week	Sub-CPMK	Sub-CLO Achievement Indicators Demonstrable by Students	Course Material	Assessment		Learning Form and Method		Duration(mi n)	Ref.No.	AccessTime
				Assessm ent Form(test /non-test)	Weight(%)	Synchron ous(Face-to-Face& Online)	Asynchronous (Individual &Group Tasks)			
6	Students are able to apply the use of Remote Sensing and GIS for Transportation (Taxonomy 3 and 4)	Students are able to apply the utilization of Remote Sensing and GIS for Transportation.	Traffic Accident Modeling Based on Spatial Data	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	3	10-03-2025 08:00
7	Students are able to apply the use of Remote Sensing and GIS for Transportation (Taxonomy 3 and 4)	Students are able to apply the utilization of Remote Sensing and GIS for Transportation.	Mass Transit Route Planning using Network Analyst	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	3	17-03-2025 08:00
8	Midterm Examination				15					24-03-2025 08:00
9	Students are able to utilize software for processing Remote Sensing and GIS data for Transportation (Taxonomy 6)	Students are able to utilize software for the processing of Remote Sensing and GIS data for Transportation.	Population Movement Patterns and Vehicle Volume Distribution	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	3	31-03-2025 08:00
10	Students are able to utilize software for processing Remote Sensing and GIS data for Transportation (Taxonomy 6)	Students are able to utilize software for the processing of Remote Sensing and GIS data for Transportation.	Integration of GIS with Real-Time Data in Transportation (Bus, Railway)	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	3	07-04-2025 08:00
11	Students are able to utilize software for processing Remote Sensing and GIS data for Transportation (Taxonomy 6)	Students are able to utilize software for the processing of Remote Sensing and GIS data for Transportation.	Toll Road Route Planning	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	3	14-04-2025 08:00

Week	Sub-CPMK	Sub-CLO Achievement Indicators Demonstrable by Students	Course Material	Assessment		Learning Form and Method		Duration(mi n)	Ref.No.	AccessTime
				Assessm ent Form(test /non-test)	Weight(%)	Synchron ous(Face-to-Face& Online)	Asynchronous (Individual &Group Tasks)			
12	Students are able to present Remote Sensing and GIS data for Transportation and analyze it for various needs (Taxonomy 4, 5, and 6)	Students are able to present RS and GIS data for Transportation and analyze them for various purposes.	Analisis matriks asal-tujuan	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	3	21-04-2025 08:00
13	Students are able to present Remote Sensing and GIS data for Transportation and analyze it for various needs (Taxonomy 4, 5, and 6)	Students are able to present RS and GIS data for Transportation and analyze them for various purposes.	Fasilitas network analyst	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	3	28-04-2025 08:00
14	Students are able to present Remote Sensing and GIS data for Transportation and analyze it for various needs (Taxonomy 4, 5, and 6)	Students are able to present RS and GIS data for Transportation and analyze them for various purposes.	Optimasi logistik dan distribusi barang dengan SIG	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	3	05-05-2025 08:00
15	Students are able to present Remote Sensing and GIS data for Transportation and analyze it for various needs (Taxonomy 4, 5, and 6)	Students are able to present RS and GIS data for Transportation and analyze them for various purposes.	Praktikum analisis jaringan transportasi menggunakan GIS	Participatory	5	Face-to-face	Search for sources relevant to the course	2 x 50	3	12-05-2025 08:00
16	Final Examination				15					19-05-2025 08:00

STUDENT LEARNING TIME (WORKLOAD)

	Activity	Synchronous(Face-to-Face / Online)	Asynchronous(Structured / Independent)	Student LearningPreparation	Total Student Learningand Instructional Time
LEARNING	Lectures / Recitation / Tutorial	14 × 90 min = 1,260 min	-x-	-x-	1,260 min (21.0 hrs)
	Project-Based Learning	-x-	8 × 90 min = 720 min	8 × 30 min = 240 min	960 min (16.0 hrs)
	Discussion (Case-Based Learning)	8 × 60 min = 480 min	-x-	8 × 30 min = 240 min	720 min (12.0 hrs)
	SUBTOTAL				2940 min (49.0 hrs)
ASSESSMENT	Continuous Assessment				
	Participation During Learning	16 × 60 min = 960 min	-x-	-x-	960 min (16.0 hrs)
	Project Work	-x-	8 × 90 min = 720 min	-x-	720 min (12.0 hrs)
	Assignment	-x-	8 × 60 min = 480 min	-x-	480 min (8.0 hrs)
	Quiz	4 × 30 min = 120 min	-x-	-x-	120 min (2.0 hrs)
	Formative				90 min (1.5 hrs)
	Summative				90 min (1.5 hrs)
	SUBTOTAL				2460 min (41.0 hrs)
TOTAL WORKLOAD					5,400 min (90 hrs))
IDEAL CREDIT HOURS					90 Hours
CREDITS (SKS)					2
CONFORMITY WITH CREDIT LOAD					COMPLIANT

CLO ASSESSMENT CRITERIA

No	CPMK	CPL					Taxonomy	Weight	KRITERIA PENCAPAIAN CPMK
		CPL-1	CPL-2	CPL-3	CPL-4	CPL-5			
1	Students are able to master the fundamental concepts of RS and GIS for Transportation (GLO 1 and GLO 2).						1	10	75% of all students achieve a minimum score of 65 (on a scale of 100)
2	Students are able to conduct observations and apply spatial information data for transportation using remote sensing and GIS for various applications (GLO 3).						3	25	75% of all students achieve a minimum score of 65 (on a scale of 100)
3	Students are able to process RS and GIS data for Transportation using software (GLO 4).						6	15	75% of all students achieve a minimum score of 65 (on a scale of 100)
4	Students are able to present and analyze RS and GIS data for Transportation (GLO 5).						4	20	75% of all students achieve a minimum score of 65 (on a scale of 100)

COLLABORATIVE ASSIGNMENT DESIGN

Collaborative Assignment Details Not Yet Available