



UNIVERSITAS PENDIDIKAN INDONESIA

SEMESTER LEARNING PLAN (RPS)

COURSE IDENTITY

Course Title	Course Code	Credits	Workload	Course Group	Semester	Prerequisite Course	Date Issued
Remote Sensing and Geographic Information Systems for Disaster Management	SA518	2	90	Program Study Skill Development	1		2025-09-09 11:26:56

Prepared by	Reviewed by	Approved by
Hendro Murtianto, M.Sc.	Shafira Himayah, S.Pd., M.Sc.	Dr. Lili Somantri, S.Pd., S.S., M.Si.

COURSE DESCRIPTION AND LEARNING OUTCOMES

Course Description	Geographically, Indonesia is located at the convergence of three tectonic plates: the Indo-Australian plate moving northward, the Eurasian plate moving southward, and the Pacific plate moving from east to west. As a result, the archipelagic territory of Indonesia has mountainous morphology and relatively rugged relief. The implication of this geological and geomorphological position is that natural disasters should already be familiar phenomena for society. However, it must honestly be acknowledged that whenever a disaster occurs, the community often becomes confused and unprepared, as if facing something entirely new. Considering this reality, breakthrough efforts are needed so that society becomes more familiar with disaster issues. According to Law Number 24 of 2007, a disaster is defined as an event or a series of events that threaten and disrupt community life and livelihoods caused by natural factors, non-natural factors, or human factors, resulting in loss of life, environmental damage, property loss, and psychological impacts. Disaster mitigation refers to a series of efforts aimed at reducing disaster risk, both through physical development and through awareness building and improving the capacity of communities to face disaster threats. The general scope of this course discusses disaster phenomena and disaster risk reduction measures. The course covers natural disasters, non-natural disasters, and social disasters. Natural disasters are disasters caused by natural events such as earthquakes, tsunamis, volcanic eruptions, floods, droughts, typhoons, and landslides. Non-natural disasters are disasters caused by non-natural events such as technological failures, modernization failures, epidemics, and disease outbreaks. Social disasters are disasters caused by human activities, including social conflicts between groups or communities and acts of terror. In addition to understanding disaster knowledge, the ability to analyze and map disasters becomes a compulsory competence for students. Disaster mapping includes mapping hazards, vulnerability, capacity, and disaster risk using several methods with an emphasis on the use of Geographic Information Systems.	
Course Learning Outcomes (CPL) Assigned to the Course	1	S6 Able to collaborate and demonstrate social sensitivity and concern for society and the environment.
	2	KU1 Able to complete broad-scope work and analyze data using various appropriate methods, both standardized and non-standardized.
	3	KU3 Able to solve work problems according to the nature and context of applied expertise fields based on logical and innovative thinking and take responsibility for the results independently.
	4	KU5 Able to prepare accurate and valid reports of results and work processes and communicate them effectively to relevant parties.
	5	P3 Master theoretical concepts of Remote Sensing for mapping natural, social, and cultural resources and possess skills in managing and processing remote sensing imagery using various remote sensing software..
	6	P4 Master theoretical concepts of Geographic Information Systems for mapping natural, social, and cultural resources and possess skills in managing and processing spatial data using various GIS software.
Course Learning Outcomes (CPMK)	1	Students are expected to be able to explain the concept of disasters and related disaster issues occurring at regional, national, and international scales.
	2	Students are able to identify the causes of disasters within the geosphere framework and their relationship with the human living environment.

	3	Students are able to map parameters that cause disasters.	
	4	Students are able to map levels of hazard potential, vulnerability, capacity, and disaster risk.	
Sub-CPMK	1	CPMK - 1	Students are able to explain disaster knowledge, scope, and disaster mitigation.
	2	CPMK - 1	Students are able to correlate Indonesia's geographical position with disaster events.
	3	CPMK - 2	Students are able to analyze geological hazards such as volcanoes and mass movements.
	4	CPMK - 2	Students are able to analyze geological hazards including earthquakes and tsunamis.
	5	CPMK - 2	Students are able to analyze hydrometeorological hazards such as floods, droughts, typhoons, and tidal waves.
	6	CPMK - 2	Students are able to analyze environmental hazards such as forest fires, environmental degradation, and waste pollution.
	7	CPMK - 3	Students understand the stages of disaster mitigation.
	8	CPMK - 3	Students understand disaster data and information management.
	9	CPMK - 4	Students are able to process and analyze disaster data.
	10	CPMK - 4	Students are able to develop spatial planning based on disaster data.
Lecture Materials	1	Scope of Disasters Definition and scope of concepts directly related to disasters such as disaster definition, hazard, vulnerability, risk, and disaster mitigation.	
	2	Indonesia's Geographical Position and Disasters Explanation of Indonesia's geographical position and its implications for disaster potential and distribution.	
	3	Geological Hazards: Volcanoes and Mass Movements Causes, types, and mitigation efforts required to anticipate and overcome these disasters.	
	4	Geological Hazards: Earthquakes and Tsunamis Causes, types, and mitigation strategies.	
	5	Hydrometeorological Hazards Floods, droughts, typhoons, tidal waves, and landslides including causes, types, and mitigation efforts.	
	6	Environmental Hazards Forest fires, environmental damage, and waste pollution including causes, types, and mitigation measures.	
	7	Disaster Mitigation Stages Early Warning System, emergency response, post-disaster rehabilitation and reconstruction.	
	8	Disaster Data and Information Management Examples of disaster information systems before and after disasters, data collection methods, and data or map presentation.	

	9	Disaster Data Processing and Analysis Field surveys and mapping at disaster locations, covering physical and social aspects and evaluating implemented mitigation strategies. Data processing using GIS software and presenting survey results in map form.
	10	Spatial Planning Based on Disaster Data Basic concepts and techniques of spatial planning based on disaster information.
Expected Learning Outputs *)	1. Reports on the preparation of basic disaster maps. 2. Field practicum reports.	
Learning Strategy		Case Method
	✓	Team based Project
		Others
Learning Activities	Lectures are conducted through: 1. Face-to-face or online meetings (hybrid), 2. Assignments and quizzes, 3. Midterm examination, 4. Field practicum, 5. Final examination. Students must pay attention to the following requirements: Attendance must exceed 80 percent of lecture sessions, The course consists of 50 percent theory and 50 percent practice, Requires the use of a PC or laptop, Uses several remote sensing and GIS software, Access the e-learning platform spada.upi.edu, Map creation tutorials can be accessed through the YouTube channel Media Belajar Geografi.	
References	1	Coburn and Spence (1994). Disaster Mitigation, United Kingdom : Cambridge Arschitectural.
	2	Don L. and Leet (1964). Earthquakes: Scientific and Simple Investigations. Yogyakarta: Kreasi Wacana.
	3	BNPB (2014). Technical Guidelines for Disaster Data and Information Collection.
	4	BNPB (2015). Technical Guidelines for Hazard and Disaster Risk Mapping at Regency or City Level.
	5	Law Number 24 of 2007 concerning Disaster Management.
	6	Regulation of the Head of BNPB Number 4 of 2008 concerning Disaster Management Planning Guidelines.
	7	Regulation of the Head of BNPB Number 8 of 2011 concerning Disaster Data Standardization.
	8	Regulation of the Head of BNPB Number 2 of 2012 concerning General Guidelines for Disaster Risk Assessment.
	9	Regulation of the Head of BNPB Number 7 of 2012 concerning Disaster Data and Information Management in Indonesia.
	10	Law of the Republic of Indonesia Number 24 of 2007 concerning Disaster Management.
	11	BNPB Regulation Number 4 of 2016 concerning Disaster Management Education and Training.
	12	Disaster Mapping Book of the Special Region of Yogyakarta, 2008.

LEARNING PLAN

Week	Sub-CPMK	Indicators of Sub-CPMK Achievement Demonstrated by Students	Lecture Materials	Assessment		Learning Methods		Duration (hours)	Reference	Access Time
				Assessment Form (test/non test)	Assessment Weight(%)	Synchronous	Asynchronous			
1	Students are able to explain disaster knowledge ,the scope of disaster studies and disaster mitigation.	1. Introduction to the Course, 2. Definition of Disaster, Types, Scope, and Disaster Mitigation	Scope of Disaster The definition and scope of concepts directly related to disasters, such as the definition of disaster, hazard, vulnerability, risk, and disaster mitigation. Disaster Mitigation The definition, scope, and objectives of disaster mitigation, as well as disaster mitigation strategies.	Participate	1	Course Face-to-Face / Virtual Lectures	Understand the material and answer quizzes or questions on spada.upi.edu	2	10	04-09-2025 07:00
2	Students are able to explain disaster knowledge, the scope of disasters, and disaster mitigation.	Review of the definitions and concepts of disasters according to laws, regulations, and policies.	Scope of Disaster The definition and scope of concepts directly related to disasters, such as the definition of disaster, hazard, vulnerability, risk, and disaster mitigation. Disaster Mitigation • The definition scope, and objectives of disaster mitigation, as well as disaster mitigation strategies.	Participate	1	Course Face-to-Face / Virtual Lectures	Understand the material and answer quizzes or questions on spada.upi.edu	2	10	11-09-2025 07:00
3	Students are able to correlate the geographical position of Indonesia with the disasters	Students are able to explain the scope of concepts that are directly related to disasters. Students are able to explain, in their own words, the definition, scope, and objectives of disaster mitigation. Students are able to explain mitigation strategies for each type of disaster.	Geographical Position of Indonesia and Disasters Explaining the geographical position of the Indonesian archipelago and its implications for disaster potential. Explaining the potential disasters and their distributions in Indonesia	Participate	1	Course Face-to-Face / Virtual Lectures	Understand the material and answer quizzes or questions on spada.upi.edu	2	1	18-09-2025 07:00

Week	Sub-CPMK	Indicators of Sub-CPMK Achievement Demonstrated by Students	Lecture Materials	Assessment		Learning Methods		Duration (hours)	Reference	Access Time
				Assessment Form (test/non test)	Assessment Weight(%)	Synchronous	Asynchronous			
4	Students are able to analyze geological hazards, particularly volcanic activity and mass movements (landslides).	Students are able to explain geological hazards, which consist of volcanic hazards and mass movements.	Geological hazards: volcanic hazards and mass movements, including their causes, types, and the mitigation efforts required to anticipate and address such disasters.	Participate	1	Course Face-to-Face / Virtual Learning.	Understand the material and answer quizzes or questions on spada.upi.edu.	2	1,2,6,10	25-09-2025 07:00
5	Students are able to analyze hydrometeorological hazards, including floods, droughts, hurricanes, and tidal floods.	Students are able to explain hydrometeorological hazards, which consist of floods, droughts, hurricanes, tidal floods, and landslides.	Hydrometeorological hazards, including floods, droughts, hurricanes, tidal floods, and landslides; their causes, types, and the mitigation efforts required to anticipate such disasters.	Participate	1	Course Face-to-Face / Virtual Learning.	Understand the material and answer quizzes or questions on spada.upi.edu.	2	1,2,5	02-10-2025 07:00
6	Students are able to explain disaster knowledge, the scope of disasters, and disaster mitigation.	Students are able to explain environmental hazards, which consist of forest fires, environmental degradation, and waste pollution.	Environmental hazards, including forest fires, environmental degradation, and waste pollution; their causes, types, and the mitigation efforts required to anticipate such hazards.	Participate	1	Course Face-to-Face / Virtual Learning.	Understand the material and answer quizzes or questions on spada.upi.edu.	2	1,2,5	09-10-2025 07:00
7	Stages of Disaster Mitigation	Students understand the stages of disaster mitigation.	Stages of Disaster Mitigation: Early Warning System; Emergency Response; Post-Disaster: Rehabilitation and Reconstruction.	Participate	1	Course Face-to-Face / Virtual Learning.	Understand the material and answer quizzes or questions on spada.upi.edu.	2	5,6,8	16-10-2025 07:00
8	Midterm Examination				18					23-10-2025 07:00

Week	Sub-CPMK	Indicators of Sub-CPMK Achievement Demonstrated by Students	Lecture Materials	Assessment		Learning Methods		Duration (hours)	Reference	Access Time
				Assessment Form (test/non test)	Assessment Weight(%)	Synchronous	Asynchronous			
9	Disaster Data and Information Management	• Students are able to identify methods for presenting disaster data and information.	Disaster Data and Information Management Examples of natural disaster information systems, before and after a disaster occurs. Methods for data collection and data compilation. Presentation of data and maps.	Participate	1	Course Face-to-Face / Virtual Learning.	Understand the material and answer quizzes or questions on spada.upi.edu.	2	3,4,7,9	30-10-2025 07:00
10	Disaster Data and Information Management	• Students are able to collect and present disaster data and information.	Disaster Data and Information Management Examples of natural disaster information systems, before and after disasters occur. Methods of data compilation and data collection. Presentation of data and maps.	Participate	1	Course Face-to-Face / Virtual Learning.	Understand the material and answer quizzes or questions on spada.upi.edu.	2	3,4,8,9	06-11-2025 07:00
11	Disaster Data and Information Management	• Students are able to collect and present disaster data and information.	Disaster Data Processing and Analysis Survey and mapping in disaster locations, where the mapped aspects include physical and social aspects, as well as the assessment of disaster mitigation strategies that have been implemented. Processing field measurement data using GIS software and presenting the survey results in the form of maps.	Participate	1	Course Face-to-Face / Virtual Learning.	Understand the material and answer quizzes or questions on spada.upi.edu.	2	3,4,7	13-11-2025 07:00

Week	Sub-CPMK	Indicators of Sub-CPMK Achievement Demonstrated by Students	Lecture Materials	Assessment		Learning Methods		Duration (hours)	Reference	Access Time
				Assessment Form (test/non test)	Assessment Weight(%)	Synchronous	Asynchronous			
12	Disaster Data Processing and Analysis	Students are able to process data obtained from surveys and measurements at disaster locations.	Disaster Data Processing and Analysis. Survey and mapping in disaster locations, where the mapped aspects include physical and social aspects, as well as the assessment of disaster mitigation strategies that have been implemented. Processing data obtained from field measurements using GIS software and presenting the survey results in the form of maps.	Performance	25	Field practicum	Laporan	2	4,8,11,12	20-11-2025 07:00
13	Disaster Data Processing and Analysis	Students are able to present disaster data and information in the form of maps.	Disaster Data Processing and Analysis Survey and mapping in disaster locations, where the mapped aspects include physical and social aspects, as well as the assessment of disaster mitigation strategies that have been implemented. Processing data obtained from field measurements using GIS software and presenting the survey results in the form of maps.	Performance	25	Field practicum	Laporan	2	4,8,11,12	27-11-2025 07:00

14	Spatial Planning Based on Disaster Data	• Students are able to analyze spatial planning based on disaster information.	Scope of Disasters The definition and scope of concepts directly related to disasters, such as the definition of disasters, hazards, vulnerability, risk, and disaster mitigation. Disaster Mitigation The definition, scope, and objectives of disaster mitigation, as well as disaster mitigation strategies.	Performance	1	Course Face-to-Face / Virtual Learning.	Understand the material and answer quizzes or questions on spada.upi.edu.	2	8,9,12	04-12-2025 07:00
Week	Sub-CPMK	Indicators of Sub-CPMK Achievement Demonstrated by Students	Lecture Materials	Assessment		Learning Methods		Duration (hours)	Reference	Access Time
				Assessment Form (test/non test)	Assessment Weight(%)	Synchronous	Asynchronous			
15	Spatial Planning Based on Disaster Data	• Students are able to provide an overview of regional spatial planning based on disaster information.	Spatial Planning Based on Disaster Data Basic concepts of spatial planning based on disaster information data. Techniques of spatial planning based on disaster information data.	Performance	1	Course Face-to-Face / Virtual Learning.	Understand the material and answer quizzes or questions on spada.upi.edu.	2	8,9,12	11-12-2025 07:00
16	Final Exams				20					18-12-2025 07:00

WAKTU BELAJAR MAHASISWA (WORKLOAD)

		Learning Activities	Synchronous Activities (Face-to-Face / Virtual)	Asynchronous Activities (Structured / Independent)	Student Learning Preparation	Total Student Learning Time
LEARNING ACTIVITIES	Lectures / Response / Tutorial		14 x 90 minutes = 1260 minutes	14 x 60 minutes = 840 minutes	14 x 30 minutes = 420 minutes	2520 minutes (42.0 hours)
	Project-Based Learning		2 x 450 minutes = 900 minutes	2 x 450 minutes = 900 minutes	2 x 30 minutes = 60 minutes	1860 minutes (31.0 hours)
	Discussion (Case-Based Learning)		-x-	4 x 60 minutes = 240 minutes	4 x 10 minutes = 40 minutes	280 minutes (4.7 hours)
	TOTAL					4660 minutes (77.7 hours)
ASSESSMENT		Continuous Assessment				
		Participation During Learning	-x-	14 x 10 minutes = 140 minutes	-x-	140 minutes (2.3 hours)
		Project Work	-x-	1 x 180 minutes = 180 minutes	-x-	180 minutes (3.0 hours)
		Assignments	-x-	1 x 180 minutes = 180 minutes	-x-	180 minutes (3.0 hours)
		Quiz	-x-	6 x 10 minutes = 60 minutes	-x-	60 minutes (1.0 hours)
		Formative Assessment				90 minutes (1.5 hours)
		Summative Assessment				90 minutes (1.5 hours)
	TOTAL					740 minutes (12.3 hours)
TOTAL COURSE WORKLOAD						5400 minutes (90 Hours)
IDEAL TOTAL HOURS						90 Hours
CREDITS (SKS)						2
COMPABILITY WITH CREDIT LOAD						APPROPRIATE

CPMK ASSESSMENT CRITERIA

No	CPMK	CPL						Taxonomy	Weight	CPMK Achievement Criteria
		CPL-1	CPL-2	CPL-3	CPL-4	CPL-5	CPL-6			
1	Students are expected to re-articulate the concept of disasters and disaster-related issues occurring at the regional, national, and international scales							3	4	70% of all students achieve a score of at least 70 (on a scale of 100)
2	Students are able to identify the causes of disasters within the geospheric framework and their relationship to the human living environment.							4	2	70% of all students achieve a score of at least 70 (on a scale of 100)
3	Students are able to map the parameters contributing to the occurrence of disasters.							5	4	70% of all students achieve a score of at least 70 (on a scale of 100)
4	Students are able to map the levels of hazard potential, vulnerability, capacity, and disaster risk							5	52	70% of all students achieve a score of at least 70 (on a scale of 100)

COLLABORATIVE TASK DESIGN

Task Title	Mapping of Hazard Levels, Vulnerability, Capacity, and Disaster Risk
Learning Method	Team based Project
Duration	
Assessment Weight	62
SUB-CPMK	Students are able to explain knowledge of disaster management, its scope, and mitigation.

Task Description
Students are required to produce disaster maps to be utilized for spatial analysis in a selected area
Task Completion Steps
1. Students collect disaster data and information.
2. Students produce base maps.
3. Students conduct geospatial data analysis, encompassing both raster and vector data, using Remote Sensing and Geographic Information Systems.
4. Students conduct field surveys for disaster data collection and ground-truthing for model verification.
5. Students produce hazard level, vulnerability, capacity, and disaster risk maps.
Detailed Deliverables
1. Disaster maps.
2. Practicum reports.
Indicators, Criteria, and Assessment Weights

1. Students produce a complete practicum report along with all maps: 85-100.
2. Students produce a practicum report with incomplete maps: 70-85.
3. Students do not produce a report conforming to the correct structure but produce complete disaster maps: 60-70.
4. Students do not produce a report conforming to the correct structure and produce incomplete disaster maps: 50-60.
5. Students produce neither a report nor maps: 0.

Implementation Schedule

Note: The total number of days in one semester is $16 \times 7 = 112$ days. The schedule may be set based on daily calculations.

Activity	Implementation Time
Field Practicum	70

OTHERS

REFERENCES

1. BNPB (2014). Technical Guidelines for Disaster Data and Information Collection.
2. Regulation of the Head of BNPB No. 4 of 2008 on Guidelines for the Preparation of Disaster Management Plans.
3. Regulation of the Head of BNPB No. 7 of 2012 on Disaster Data and Information Management in Indonesia.
4. Head of BNPB Regulation No. 4 of 2016 on Disaster Management Education and Training.
5. Book on Disaster Mapping of DIY Province, 2008.