



UNIVERSITAS PENDIDIKAN INDONESIA

SEMESTER LEARNING PLAN (RPS)

COURSE IDENTITY

Course Name	Course Code	Credits	Workload	Course Group	Semester	Prerequisite Course	Date Issued
BASIC REMOTE SENSING	SA223	4	180	Core Expertise Course of The Study Program	2	Carthography	2025-01-31 08:52:49

Prepared By	Reviewed By	Approved By
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COURSE DESCRIPTION

Course Description	Basic Remote Sensing is a course designed to develop the core expertise within the study program.		
Program Learning Outcomes Assigned to the Course	1	Able to master the theoretical concepts of Geographic Information Systems, spatial database concepts, and spatial modeling concepts.	
	2	Able to plan, interpret, analyze, classify, extract, validate, and visualize data and information derived from remote sensing based on science and technology.	
	3	Able to integrate learning and innovation skills, mastery of technology and information, career development, and life skills to become lifelong learners.	
Course Learning Outcomes (CPMK)	1	S8 Internalizing academic values, norms, and ethics.	
	2	Able to master the basic concepts of regional surveying and mapping, as well as the fundamentals and applications of mathematics and statistics in the field of regional surveying and mapping.	
	3	Able to demonstrate independent, high-quality, and measurable performance; able to examine the implications of the development or implementation of science and technology while applying humanistic values according to scientific principles and ethics.	
	4	Able to plan, interpret, analyze, classify, extract, validate, and visualize data and information derived from remote sensing based on science and technology.	
Sub Course Learning Outcomes	1	CPMK - 1	Understanding the definition and scope of remote sensing
	2	CPMK - 2	Understanding the components used in remote sensing
	3	CPMK - 2	Understanding the physics of remote sensing
	4	CPMK - 4	Understanding interpretation and its application to remote sensing imagery
	5	CPMK - 2	Understanding photographic and non-photographic remote sensing systems
	6	CPMK - 4	Understanding photogrammetry
	7	CPMK - 3	Understanding the application of remote sensing in various fields
	8	CPMK - 2	Understanding ENVI software and types of image data
	9	CPMK - 3	Able to explain and perform geometric correction of imagery
	10	CPMK - 3	Able to explain and perform radiometric correction of imagery

	11	CPMK - 4	Able to determine image composites and explain spectral curve characteristics of objects in different bands
	12	CPMK - 4	Understanding supervised multispectral classification
	13	CPMK - 4	Understanding unsupervised multispectral classification
	14	CPMK - 3	Understanding and applying accuracy testing methods for land cover classification
Course Materials	1	Definition and scope of remote sensing	
	2	Remote sensing components and satellite orbits	
	3	Basic physics of remote sensing	
	4	Remote sensing image interpretation	
	5	Photographic and non-photographic remote sensing systems	
	6	Photogrammetry	
	7	Remote sensing for various applications	
	8	Introduction to ENVI and image data	
	9	Geometric correction	
	10	Radiometric correction	
	11	Image composite and spectral curves	
	12	Supervised land cover classification	
	13	Unsupervised land cover classification	
	14	Accuracy testing of classification results	
Learning Outcomes Demonstrated at the End of the Course *)	Manual interpretation map derived from aerial photographs or printed imagery, Digital land cover map from supervised classification, Digital land cover map from unsupervised classification, Accuracy assessment results, and Practicum report		
Learning Strategy	✓	Case Method	
		Team based Project	
		Other supporting methods	

Learning Steps	The Basic Remote Sensing course is conducted through face-to-face learning consisting of 7 theoretical sessions, 7 practical sessions, 1 midterm examination, and 1 final examination. The course materials include the definition and scope of remote sensing, components of remote sensing and satellite orbits, basic physics of remote sensing, photographic and non-photographic remote sensing systems, photogrammetry, applications of remote sensing in various fields, introduction to ENVI software and image data, geometric correction, radiometric correction, image composite and spectral curve characteristics of objects, supervised and unsupervised land cover classification, and accuracy assessment of classification results. Classroom learning activities are not limited to the delivery of lecture materials, but also involve active discussions and question-and-answer sessions between students and the lecturer. Students are encouraged to seek additional reference materials to broaden their knowledge of basic remote sensing. Practical activities aim to enhance students' technical abilities in processing image data until they are able to produce maps that have undergone accuracy assessment.	
References	1	Danoedoro, (2012), Pengantar Penginderaan Jauh Digital, Andi, Yogyakarta.
	2	Dede Sugandi, (1991), Interpretasi Peta Topografi dan Foto Udara, Jurusan Pendidikan Geografi FPIPS IKIP Bandung.
	3	Dede Sugandi, (1999), Dasar-dasar Penginderaan Jauh. Geografi FPIPS IKIP Bandung.
	4	Lillesand dan Kiefer, (1990), Penginderaan Jauh dan Interpretasi citra, Gadjah University Press.
	5	Sabin, (1978), Remote Sensing and Interpretation, Mc Graw Hill, New York.
	6	Sutanto, (1999), Penginderaan Jauh, Gadjah Mada University Press.

LEARNING PLAN

Week	Sub-CPMK	Learning Indicator	Course Material	Assessment		Learning Methods		Duration (hours)	Reference	Access Time
				Assessment Methods	Assessment Weighting(%)	Synchronous	Asynchronous			
1	Understanding the definition and scope of remote sensing	Students are able to explain the objectives, scope, definition, development, advantages, and limitations of remote sensing.	Definition and scope of remote sensing.	Observation.	2	Face-to-face lecture, discussion, and question–answer session on the definition and scope of remote sensing	Students are directed to search for relevant references regarding the definition, scope, and development of remote sensing	4	3,6	03-02-2025 10:20
2	Understanding the definition and scope of remote sensing	Students are able to explain the components of remote sensing including energy sources, objects, sensors, platforms, and satellite orbits	Components of remote sensing and satellite orbit	Observation.	2	Face-to-face lecture, discussion, and question–answer session about remote sensing components	Students search for relevant references related to remote sensing components	4	3,6	10-02-2025 10:20
3	Understanding the physics of remote sensing	Students are able to explain remote sensing physics including energy systems, energy interaction, and atmospheric windows	Basic physics of remote sensing	Observation.	2	Face-to-face lecture, discussion, and question–answer session on basic remote sensing physics	Students search references regarding energy sources and remote sensing systems	4	3,6	17-02-2025 10:20
4	Understanding photographic and non-photographic remote sensing systems	Students understand and are able to explain the electromagnetic spectrum, photographic systems, types of aerial photographs, and non-photographic remote sensing systems	Photographic and non-photographic remote sensing systems	Observation.	3	Face-to-face lecture, discussion, and question–answer session	Students search references about various types of photographic and non-photographic image data	4	4,6	24-02-2025 07:00

Week	Sub-CPMK	Learning Indicator	Course Material	Assessment		Learning Methods		Duration (hours)	Reference	Access Time
				Assessment Methods	Assessment Weighting(%)	Synchronous	Asynchronous			
5	Understanding and applying interpretation on remote sensing imagery	Students understand interpretation techniques and elements and are able to interpret objects in imagery	Remote sensing image interpretation	Portofolio	4	Face-to-face learning and interpretation practice using remote sensing imagery	Students conduct interpretation and produce a tentative map layout	4	4,5	03-03-2025 07:00
6	Understanding photogrammetry	Students explain photogrammetry concepts, aerial photo edge information, distortion and displacement, aircraft position, and calculate aerial photograph scale	Photogrammetry	Portofolio	4	Face-to-face learning and calculations using aerial photographs	Students draw aerial photo diagrams and edge information	4	2,5	10-03-2025 07:00
7	Understanding applications of remote sensing	Students explain applications of remote sensing systems and imagery for various fields	Remote sensing applications	Portofolio	3	Face-to-face lecture, discussion, and Q&A	Students prepare a review paper about remote sensing applications	4	3,6	17-03-2025 07:00
8	Midterm Examination				10					24-03-2025 07:00
9	Understanding ENVI software and image data types	Students explain ENVI features and image data specifications	Introduction to ENVI and image data	Observation.	7	Face-to-face lecture, discussion, and Q&A	Students search references about metadata and image specifications	4	1	01-04-2025 07:00
10	Performing geometric correction	Students perform geometric correction on imagery	Geometric correction	Observation.	7	Lecture, discussion, Q&A, and practice of geometric correction	Students search references related to radiometric correction	4	1	07-04-2025 07:00

Week	Sub-CPMK	Learning Indicator	Course Material	Assessment		Learning Methods		Duration (hours)	Reference	Access Time
				Assessment Methods	Assessment Weighting(%)	Synchronous	Asynchronous			
11	Performing radiometric correction	Students perform radiometric correction on imagery	Radiometric correction	Observation.	7	Lecture, discussion, Q&A, and correction practice	Students search references about image composites and spectral characteristics	4	1	14-04-2025 07:00
12	Determining image composite and spectral curves	Students select appropriate image composites and understand spectral responses of objects	Image composite and spectral curves	Portfolio	7	Lecture, discussion, and Q&A about spectral curves	Students search references about spectral curves of objects	4	1	21-04-2025 07:00
13	Understanding supervised multispectral classification	Students perform supervised multispectral classification	Supervised land cover classification	Portfolio	7	Practice in supervised land cover classification	Continue preparing digital maps	4	1	28-04-2025 07:00
14	Understanding unsupervised multispectral classification	Students perform unsupervised multispectral classification	Unsupervised land cover classification	Portfolio	7	Practice in unsupervised classification	Continue preparing digital maps	4	1	05-05-2025 07:00
15	Applying classification accuracy assessment	Students perform accuracy assessment of multispectral land cover classification	Accuracy assessment	Portfolio	8	Practice conducting accuracy assessment	Continue preparing classification report	4	1	12-05-2025 07:00
16	Final Examination				20					19-05-2025 07:00

STUDENT LEARNING WORKLOAD

STUDENT LEARNING WORKLOAD						
LEARNING ACTIVITIES	Learning Activities		Synchronous Activities (Face-to-Face / Virtual)	Asynchronous Activities (Structured / Independent)	Student Learning Preparation	Total Student Learning Time
	Lectures / Response / Tutorial		14 × 150 minutes = 2100 minutes	14 × 90 minutes = 1260 minutes	14 × 20 minutes = 280 minutes	3640 minutes (60.7 hours)
	Project-Based Learning		7 × 150 minutes = 1050 minutes	7 × 90 minutes = 630 minutes	-x-	1680 minutes (28.0 hours)
	Discussion (Case-Based Learning)		14 × 90 minutes = 1260 minutes	14 × 60 minutes = 840 minutes	14 × 20 minutes = 280 minutes	2380 minutes (39.7 hours)
	TOTAL					7700 minutes (128.3 hours)
ASSESSMENT		Continuous Assessment				
		Participation During Learning	14 × 45 minutes = 630 minutes	-x-	-x-	630 minutes (10.5 hours)
		Project Work	7 × 150 minutes = 1050 minutes	7 × 120 minutes = 840 minutes	-x-	1890 minutes (31.5 hours)
		Assignments	-x-	2 × 110 minutes = 220 minutes	-x-	220 minutes (3.7 hours)
		Quiz	-x-	-x-	-x-	0 minutes (0.0 hours)
		Formative Assessment				120 minutes (2.0 hours)
		Summative Assessment				240 minutes (4.0 hours)
	TOTAL					3100 minutes (51.7 hours)
TOTAL COURSE WORKLOAD						10800 minutes (180 hours)
IDEAL TOTAL HOURS						180 hours
CREDITS (SKS)						4
COMPABILITY WITH CREDIT LOAD						APPROPRIATE

CPMK ASSESSMENT CRITERIA

No	CPMK	CPL			Taxonomy	Weight	CPMK Achievement Criteria
		CPL-1	CPL-2	CPL-3			
1	S8 Internalizing values, norms, and academic ethics				3	4	85% of all students obtain a minimum score of 85 (scale of 100)
2	P2 Mastering the basic concepts of regional surveying and mapping, as well as the basic and applied mathematics and statistics in regional surveying and mapping				2	12	70% of all students obtain a minimum score of 70 (scale of 100)
3	KU2 Demonstrating independent, quality, and measurable performance; able to examine the implications of the development or implementation of science and technology while considering and applying humanistic values according to their expertise based on scientific rules, procedures, and ethics in order to produce solutions, ideas, designs, or artistic criticism				3	25	70% of all students obtain a minimum score of 75 (scale of 100)
4	KK3 Planning, interpreting, analyzing, classifying, extracting, validating, and visualizing data and information derived from remote sensing results based on science and technology				4	29	75% of all students obtain a minimum score of 80 (scale of 100)

COLLABORATIVE ASSIGNMENT DESIGN

ASSIGNMENT TITLE	Creating a thematic map from manual interpretation and producing a digital land cover map using supervised and unsupervised classification methods
LEARNING METHOD	Case Method
TIME	
ASSESSMENT WEIGHT	50
SUB-CPMK	Understanding and applying interpretation on remote sensing imagery

ASSIGNMENT DESCRIPTION

Students independently produce both manual and digital maps according to the assigned theme. Manual maps are produced using raphido and aerial photograph data, while digital land cover maps are created using ENVI software.

TASK PROCEDURE

Manual Map

1. Preparing tools and materials
2. Conducting interpretation and delineation from aerial photographs and printed imagery
3. Applying symbology
4. Creating the map layout

DIGITAL MAP

1. Performing geometric and radiometric correction on Landsat 8 data
2. Conducting supervised and unsupervised multispectral land cover classification
3. Performing accuracy assessment of multispectral classification results
4. Reclassification of multispectral classification results
5. Applying symbology
6. Map layouting
7. Preparing the practicum report

OUTPUT DETAILS

1. Manual map from visual interpretation
2. Digital land cover map from supervised and unsupervised multispectral classification
3. Confusion matrix table
4. Practicum report

ASSESSMENT INDICATORS, CRITERIA, AND WEIGHT

The neatness and accuracy of the produced maps based on interpretation results, multispectral classification, and visualization according to cartographic principles

Assessment applies to each map and the practicum report
Maximum score: 100

IMPLEMENTATION SCHEDULE

Notes: The total number of days in one semester is calculated as 16×7 , resulting in 112 days. The implementation schedule may be determined based on this calculation of the total number of days.

Activity	Implementation Time
Manual map creation	29, 36, 42
Supervised digital land cover map	85
Unsupervised digital land cover map	92
Accuracy calculation of land cover classification	99

OTHERS

REFERENCES

1. Danoedoro, (2012), Pengantar Penginderaan Jauh Digital, Andi, Yogyakarta.
2. Dede Sugandi, (1991), Interpretasi Peta Topografi dan Foto Udara, Jurusan Pendidikan Geografi FPIPS IKIP Bandung.
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