SEMESTER LEARNING PLAN
DEPARTMENT OF GEOMATICS ENGINEERING
FACULTY OF CIVIL, PLANNING, and GEO ENGINEERING

PROGRAM	**UNDERGRADUATE**		
COURSE NAME	**Introduction to Remote Sensing**	**CODE**	**RM184519**
SEMESTER	**V (five)**	**CREDITS**	**3 (three)**
LECTURERS	**Prof. Dr. Ir. Bangun Muljo Sukojo, DEA, DESS**		

COURSE MATERIALS	1	The concept of remote sensing, the history, the basic principle, the fundamental physics of electromagnetic waves, remote sensing platforms, satellite geometry
	2	The earth's surface
	3	Interpretation, basic definition, basic interpretation, interpretation keys, types, method, process, tools, and data interpretation in remote sensing
	4	Geometric and radiometric correction, the use of formulas, radiometric calibration, the use of software, and image classification
EXPECTED LEARNING OUTCOMES THAT IMPOSED IN THE COURSE	A	Able to apply mathematics, science, and engineering in the fields of geodesy, surveying, hydrography, remote sensing, photogrammetry, geographic information systems, and cadastral to gain a thorough. understanding of the principles of engineering
	C	Able to identify, formulate, analyze and solve problems in the fields of geodesy, surveying, hydrographic, remote sensing, photogrammetry, and cadastral.
	D	Able to perform spatial data acquisition using modern measurement methods, geospatial data processing, using industry standard software, and making standard designs and analyzes in the fields of geodesy, surveying, hydrography, remote sensing, photogrammetry, and cadastral.
	E	Able to apply information & communication technology and the latest technological developments in the fields of geodesy, surveying, hydrographic, remote sensing, photogrammetry, geographic information systems, and cadastral.
COURSE LEARNING OUTCOMES	1	Able to understand the history and basic concept of remote sensing and the lastest developments of science and geospatial information technology in the field of geodesy & surveying, geodynamics & environment, geospatial, geomarine, and cadastral.
	2	Gaining a skill to process remote sensing image data and the lastest developments of science and geospatial information technology in the field of geodesy & surveying, geodynamics & environment, geospatial, geomarine, and cadastral.
	3	Gaining a skill to process radiometric calibration, geometric correction, and the lastest developments of science and geospatial information technology in the field of geodesy & surveying, geodynamics & environment, geospatial, geomarine, and cadastral.
	4	Able to do image interpretation and classification and the lastest developments of science and geospatial information technology in the field of geodesy & surveying, geodynamics & environment, geospatial, geomarine, and cadastral.

ABILITY CATEGORIES	*Cognitive Prosecess*	*Analyse*
	Knowledge Domain	*Procedural*
	Psychomotor	*Conscious control*
	Affective	*Change of attitude*

Class	Lesson learning outcome	Criteria dan Assessment Indicator	Weight	Learning Materials	Learning Experience	Learning Methods	Estimated Time
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Able to explain the concept, history, and basic principle of remote sensing	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	5,00%	1. Explain the concept of remote sensing	Lecture	Teacher-centered learning	1 x 50'
				2. Explain the history of remote sensing	Lecture	Teacher-centered learning	1 x 50'
				3. Explain the basic principle of remote sensing	Lecture	Teacher-centered learning	1 x 50'
2	Able to explain the fundamental physics of electromagnetic waves, platforms, and satellite geometry	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	5,00%	1. Explain the fundamental physics of electromagnetic waves	Lecture	Teacher-centered learning	1 x 50'
				2. Explain the platforms used in remote sensing	Lecture	Teacher-centered learning	1 x 50'
				3. Explain satellite geometry	Lecture	Teacher-centered learning	1 x 50'
				4. Real case studies	Discussion	Student-centered learning	1 x 50'
3	Able to explain the types and specification of remote sensing images, and the principle of active and pasive remote sensing	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	10,00%	1. Explain the types and specification of remote sensing images	Lecture	Teacher-centered learning	1 x 50'
				2. Explain the official names of topographic which have a characteristic of natural object	Lecture	Teacher-centered learning	1 x 50'
				3. Explain active sensors in remote sensing	Lecture	Teacher-centered learning	1 x 50'
				4. Explain pasive sensors in remote sensing	Lecture	Teacher-centered learning	1 x 50'
					Exercise and Task	Student-centered learning	1 x 50'
4-5	Able to explain the reflectance characteristics of surface	Completeness of material, depth of explanation, effectiveness of	10,00%	1. Explain the reflectance characteristics of surface objects	Lecture	Teacher-centered learning	2 x 50'
				2. Explain the reflectance characteristics of vegetation	Lecture	Teacher-centered learning	2 x 50'

4-5	characteristics of surface objects	Explanation, effectiveness of communication, accuracy of attitude	10,00%	3. Explain the reflectance characteristics of soil and water	Lecture	Problem-based learning	2 x 50'
					Exercise and Task	Student-centered learning	1 x 50'
6	Able to explain image interpretation, its concept in remote sensing, and principals of image interpretation	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	10,00%	1. Explain image interpretation	Lecture	Teacher-centered learning	1 x 50'
				2. Explain the concept in remote sensing	Lecture	Teacher-centered learning	1 x 50'
				3. Explain principals of image interpretation	Lecture	Teacher-centered learning	1 x 50'
					Task Response	Student-centered learning	1 x 50'
7	Able to explain the meaning of interpretation keys, types, methods, process, tools, and data interpretation	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	10,00%	1. Explain the interpretation keys	Lecture	Teacher-centered learning	1 x 50'
				2. Explain the types and methods of interpretation	Lecture	Teacher-centered learning	1 x 50'
				3. Explain the process, tools, and data interpretation	Lecture	Teacher-centered learning	1 x 50'
					Big Task	Student-centered learning	
8	Mid-Semester Evaluation						
9-10	Able to explain corrections in remote sensing, and to perform geometric and radiometric corrections	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	15,00%	1. Explain and do geometric correction	Lecture	Teacher-centered learning	2 x 50'
				2. Explain and do radiometric correction	Lecture	Teacher-centered learning	2 x 50'
					Dicsussion	Problem-based learning	2 x 50'
					Response and Task	Student-centered learning	2 x 50'
11	Able to explain the meaning and use of formulas in radiometric calibration	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	10,00%	1. Explain and use formulas or equations	Lecture	Teacher-centered learning	1 x 50'
				2. Explain and do radiometric calibration	Lecture	Teacher-centered learning	1 x 50'
					Dicsussion	Problem-based learning	1 x 60'
					Response and Task	Student-centered learning	
12-13	Able to explain and use software for image processing	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	15,00%	1. Explain the use of software for image processing	Lecture	Teacher-centered learning	2 x 50'
				2. Explain and do image processing	Discussion	Student-centered learning	2 x 50'
					Task	Problem-based learning	2 x 60'
14	Able to explain the meaning of image classification	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	5,00%	1. Explain and do image classification	Lecture	Teacher-centered learning	1 x 50'
				2. Explain the process of image classification	Lecture	Teacher-centered learning	1 x 50'
				3. Explain and do image processing	Discussion	Student-centered learning	1 x 50'
					Task	Student-centered learning	1 x 50'
15	Able to analyze the result of image processing	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	5,00%	1. Explain the result of image classification	Lecture	Teacher-centered learning	1 x 50'
				2. Analyze the procedures of image classification	Lecture	Teacher-centered learning	1 x 50'
					Exercise	Student-centered learning	1 x 50'
					Task	Student-centered learning	1 x 50'
16	Final Semester Evaluation						