



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

PROGRAM	UNDERGRADUATE		
COURSE NAME	Transformation System and Map Projection	CODE	RM184938
SEMESTER	Elective Course	CREDITS	2 (two)
LECTURERS	Ira Mutiara Anjasmara [Coord]		
COURSE MATERIALS	1	The concept of gravity	
	2	Source of gravity data	
	3	Dedicated gravity satellite mission	
	4	Global Geoid Model	
	5	Gravimetric geoid	
	6	Methods of geoid modeling	
	7	Validation of geoid model	
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.	
COURSE LEARNING OUTCOMES	1	Able to explain the basic concepts of various geoid modeling methods	
	2	Able to create gravimetric geoid models using various methods from gravity data obtained from measurements	
	3	Able to perform analysis and validation of the resulting geoid model	
ABILITY CATEGORIES	<i>Cognitive Prosecess</i>	<i>Analyse</i>	
	<i>Knowledge Domain</i>	<i>Procedural</i>	
	<i>Psychomotor</i>	<i>Conscious control</i>	
	<i>Affective</i>	<i>Change of attitude</i>	

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 of gravity as the basic data in geoid modeling	Completeness of materials, the depth of explanations, correctness of the answers, communication effectiveness, proper attitude	5	Review of Geodesy science Earth's gravity concept in the geoid modeling	Lecturer Discussion	Teacher-centered learning Student-centered learning	1 x 50' 1 x 50'
2-3	Able to identify gravity data sources that can be used in the geoid modeling	Completeness of materials, the depth of explanations, correctness of the answers, communication effectiveness, proper attitude	10	Terrestrial gravity Marine gravity Airborne gravity Altimetry satellite system Gravity dedicated satellite mission (CHAMP, GRACE, GOCE)	Lecturer Discussion Practice Assignment 1	Teacher-centered learning Student-centered learning Problem-based learning	1 x 50' 1 x 50' 2 x 50'
4-5	Able to explain the concept of global geoid modeling and	Completeness of materials, the depth of explanations, correctness of the	15	Geoid determination from gravity data Global geoid models	Lecturer Discussion	Teacher-centered learning Student-centered learning	1 x 50' 1 x 50'

	identify data sources used in various global geoid models	answers, communication effectiveness, proper attitude		- Static Model - Temporal Model - Topographic Gravity Field Model	Practice	Problem-based learning	2 x 50'
					Assignment 2		
6-7	Able to explain the concept of geoid determination and identify geoid models generated from various data	Completeness of materials, the depth of explanations, correctness of the answers, communication effectiveness, proper attitude	20	Methods of geoid determination - Gravimetric geoid - Geometric geoid - Hybrid geoid	Lecturer	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
					Practice	Problem-based learning	2 x 50'
8	Able to convey the results of simple research in the form of report / papers and present them			Assessment	Oral presentation	Assessment	2 x 50'
9-10	Able to explain the concepts and perform gravimetric geoid calculations	Completeness of materials, the depth of explanations, correctness of the application, correctness of the answers, communication effectiveness, proper attitude	20	Stokes Integral Solution of Stokes Integral	Lecturer	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
					Practice	Problem-based learning	2 x 50'
					Assignment 3		
11-13	Able to perform geoid modeling with various methods	Completeness of materials, the depth of explanations, correctness of the application, correctness of the answers, communication effectiveness, proper attitude	20	Direct numerical integration Fast Fourier Transform Least-squares Collocation	Lecturer	Teacher-centered learning	2 x 50'
					Discussion	Student-centered learning	1 x 50'
					Practice	Problem-based learning	3 x 50'
					Assignment 4		
14-15	Able to analyse and validate geoid models	Completeness of materials, the depth of explanations, correctness of the application, correctness of the answers, communication effectiveness, proper attitude	10	Metode-metode validasi geoid	Lecturer	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
					Practice	Problem-based learning	2 x 50'
16	Able to convey the results of simple research in the form of report / papers and present them			Assessment	Oral presentation	Assessment	2 x 50'
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