



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

PROGRAM	UNDERGRADUATE		
COURSE NAME	Geodesy Control Network	CODE	RM184518
SEMESTER	V (five)	CREDITS	3 (three)
LECTURERS	Ira Mutiara Anjasmara [coord] Bangun Muljo Sukojo, Eko Yuli Handoko, Yanto Budisusanto, Nurwatik, Rohmaneo Darminto		
COURSE MATERIALS	1	The basic concept of geodesy is related to the mathematical modeling of the earth in the form of reference ellipsoids and geometric shapes of ellipsoids	
	2	Basic concepts (coordinate system, triangulation network, trilateration network, triangulation network)	
	3	Horizontal geodesy control network and vertical geodesy control network system	
	4	Local, National, Regional and International Geodetic Control Network (ITRF)	
	5	Horizontal Geodetic Frame Network Design	
	6	Calculate the strength of the network configuration (strength of figure)	
	7	Calculating leveling of unconstrained and constrained network with conditional alignment (geometry)	
	8	Calculates leveling of unconstrained and constrained network with parameter leveling	
	9	Geodetic Frame Network Optimization	
	10	Geodetic Frame Network for various special purposes (eg Deformation Monitoring)	
EXPECTED LEARNING OUTCOMES THAT IMPOSED IN THE COURSE	B	Able to design survey and mapping activities using the latest technology in the fields of geodesy, surveying, hydrographic, remote sensing, photogrammetry, and cadastral.	
	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.	
	G	Able to plan, perform and evaluate the process of surveying and mapping activities using the latest technology in the fields of geodesy, surveying, hydrographic, remote sensing, photogrammetry, and cadastral.	
COURSE LEARNING OUTCOMES	1	Able to explain geodetic concepts related to the earth's mathematical model (reference ellipsoide)	
	2	Able to explain the concept of coordinate system and geodetic method of determining coordinates using various methods	
	3	Able to explain and apply the concept of horizontal and vertical control network in the field of geodesy / geomatics	
	4	Able to explain and identify the types of local, national and international geodetic control network	
	5	Able to explain and create horizontal geodetic control network design	
	6	Able to calculate the strength of the network configuration (strength of figure)	
	7	Capable of leveling unconstrained and constrained network using the least squares method	
	8	Able to carry out optimization and evaluation of the Geodesy Control Network	
	9	Able to apply the process of procurement and evaluation of geodetic control networks for various purposes (eg Deformation Monitoring)	
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 and apply the concept of datum and geodesy coordinate system in the field of geodesy / geomatics	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	5	Introduction - Geodesy Datum - Geodesy Coordinate System	Lecturer Discussion Practice	Lecture centered learning Student centered Problem based	1 x 50' 1 x 50' 1 x 50'
2 - 3	Able to explain and apply the concept of datum and geodesy coordinate system in the field of geodesy / geomatics	Completeness of material, depth of explanation, accuracy of answers, effectiveness of communication, attitude accuracy	10	The concept of a geodetic control network - Definition of a geodetic control network - Types of geodetic control network (horizontal, vertical, gravity) - Classification of geodetic control network (order 0, order 1, order 2, order 3)	Lecturer Discussion Practice Assignment 1	Lecture centered learning Student centered learning Problem based learning	2 x 50' 2 x 50' 2 x 50'
4 - 5	Able to explain the standards in the procurement of national geodetic control network	Completeness of material, depth of explanation, accuracy of answers, effectiveness of communication, attitude accuracy	10	Standard procurement of geodetic control network - SNI horizontal control network	Lecturer Discussion	Lecture centered learning Student centered learning	2 x 50' 2 x 50'

	and identify classes in the procurement of national geodetic control network			- SNI vertical control network - SNI gravity control National Geodetic Control network in Indonesia	Practice Assignment 2	Problem based learning	2 x 50'
6 - 7	Able to explain procedures for procuring geodetic control network	Completeness of material, depth of explanation, accuracy of procedures, effectiveness of communication, accuracy of attitude	15	Geodetic control network procurement - Geodesy control network design (strength of figure, measurement method) - Measurement of the geodetic control network - Calculation of geodetic control network (strength of figure, mesh alignment) - Analysis of the geodetic control network (quality control)	Lecturer Discussion Practice Assignment 3	Lecture centered learning Student centered learning Problem based learning	2 x 50' 2 x 50' 2 x 50'
8				Mid Semester Exam	Assessment		2 x 50'
9	Able to design and calculate the strength value of the geodetic control network	Material completeness, depth of explanation, accuracy of results, effectiveness of communication, accuracy of attitude	10	Classification of geodesic control network Calculation of strength of figures	Lecturer Discussion Practice Assignment 4	Lecture centered learning Student centered learning Problem based learning	1 x 50' 1 x 50' 1 x 50'
10 - 11	Able to apply procedures in the procurement of geodesy control network in the field of geodesy / geomatics	Material completeness, depth of explanation, accuracy of results, effectiveness of communication, accuracy of attitude	15	Geodetic control network measurement - conventional method (polygons, triangulation, trilateration, triangulation) - modern method (GNSS)	Lecturer Discussion Practice Assignment 5	Lecture centered learning Student centered learning Problem based learning	2 x 50' 2 x 50' 2 x 50'
12 - 13	Able to do geodesy control network leveling calculations	Material completeness, depth of explanation, accuracy of results, effectiveness of communication, accuracy of attitude	20	Geodetic control network calculation and - JKG leveling - JKG Quality Measurement * Accuracy of JKG (network Precision) (Global precision, local precision) * Strength of JKG (network Reliability) (internal external)	Lecturer Discussion Practice Assignment 6	Lecture centered learning Student centered learning Problem based learning	2 x 50' 2 x 50' 2 x 50'
13 - 14	Able to optimize the geodetic control reference frame network	Material completeness, depth of explanation, accuracy of results, effectiveness of communication, accuracy of attitude	10	Geodesy control network optimization - Optimization of JKG based on criteria (precision, network strength) - JKG optimization method ("Trial and Error" and Simulation Methods) Computer; Analytical Method;)	Lecturer Discussion Practice Assignment 7	Lecture centered learning Student centered learning Problem based learning	2 x 50' 2 x 50' 2 x 50'
15	Able to apply the concepts, procedures and analysis of geodesy control network in the field of geodesy / geomatics	Material completeness, depth of explanation, accuracy of results, effectiveness of communication, accuracy of attitude	5	Utilization of geodetic control network - In the field of surveying and mapping - in the field of photogrammetry and remote sensing - For deformation monitoring	Lecturer Discussion Practice Assignment 8	Lecture centered learning Student centered learning Problem based learning	1 x 50' 1 x 50' 1 x 50'
16				Final Semester Exam	Assessment		2 x 50'