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

PROGRAM	**UNDERGRADUATE**		
COURSE NAME	**Engineering Survey**	**CODE**	**RM184413**
SEMESTER	**IV (four)**	**CREDITS**	**3 (three)**
LECTURERS	**Yuwono [coord]**		
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COURSE MATERIALS	1	Fundamentals of mathematics Geometry and trigonometry.
	2	Building height measurement application.
	3	Road geometry.
	4	Horizontal and vertical alignment.
	5	Horizontal and Vertical Staking Out Alignments.
	6	Staking out of buildings and lots.
	7	Measurement and calculation of the volume of cut and fill.
EXPECTED LEARNING OUTCOMES THAT IMPOSED IN THE COURSE	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.
	F	Able to compile scientific reports and provide solutions based on leadership, creativity and communication skills as well as being responsible for the work done.
	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.
	H	Able to work in inter-disciplinary and inter-cultural teams so they can compete at national and international levels.
COURSE LEARNING OUTCOMES	1	Understand the use of basic mathematical formulas, geometry and trigonometry.
	2	Able to measure the height and slope of a building.
	3	Able to do horizontal and vertical staking out for simple curves.
	4	Capable of measuring and staking out (uit zet) for buildings.
	5	Able to measure and calculate soil volume (cut and fill).

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 - 2	Able to explain the concepts of calculus basics for engineering surveys	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	10%	The postulates in triangles, the principle of sine comparison, the cosine formula, tangent, and the inverse	Lectures	Teacher-centered learning	2 x 50'
				The principle of line alignment, angular angles, obtuse angles, and taper	Discussion	Student-centered learning	2 x 50'
					Exercise	Problem-based	2 x 50'
					Assignment		
3	Able to explain highway geometry in general	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	5%	Straight ronad, bend, superelevate, road surface height	Lectures	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
					Exercise	Problem-based learning	1 x 50'
					Assignment		
4	Able to explain the basic concepts of horizontal	Material completeness, depth of explanation, effectiveness of	10%	The central point of the curve (O),	Lectures	Teacher-centered learning	1 x 50'

	alignment, the main parts of the horizontal curve.	communication, accuracy of attitude		Arch radius (R),	Discussion	Student-centered	1 x 50'
				The intersection of the hand, the tangent line, the starting point of the curve	Exercise	Problem-based learning	1 x 50'
				Arch end point.	Assignment		
5 - 6	Able to explain Horizontal Staking Out Alignment in several method, the difference between the bow is the same length, the difference between the same length arc, etc.	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	15%	Staking out: Bow difference equal	Lectures	Teacher-centered learning	2 x 50'
				Abscissa difference is the same length	Discussion	Student-centered learning	2 x 50'
				Polar	Exercise	Problem-based learning	2 x 50'
				Polygon	Assignment-1		
				Bowstring extension			
7	Able to explain the concept of vertical alignment that has a starting and ending point, as well as symmetrical and asymmetrical types.	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	10%	The slope meaning (g)	Lectures	Teacher-centered learning	1 x 50'
				Slope in percent	Discussion	Student-centered learning	1 x 50'
				Stationing	Exercise	Problem-based learning	1 x 50'
				Slope changes	Assignment		
8				Mid Semester Evaluation			
9 - 10 - 11	Able to explain vertical alignment staking out by showing the location of the turning point, the height of the turning point (extreme).	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	25%	Understanding the length of the vertical bend	Lectures	Teacher-centered learning	3 x 50'
				Division in stationing	Discussion	Student-centered learning	3 x 50'
				Curved starting point	Exercise	Problem-based learning	3 x 50'
				Curved endpoint	Assignment		
				Height along the curve according to the distance			
				Extreme point			
				Extreme location			
12 - 13	Able to apply the concept of coordinates to uitzet buildings	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	10%	Understanding coordinates 2 dimention (x, y)	Lectures	Teacher-centered learning	2 x 50'
				Line alignment	Discussion	Student-centered learning	2 x 50'
				Line straightness	Exercise	Problem-based learning	2 x 50'
				Line straightforwardness	Assignment		
				Comparison of triangle similarity			
14 - 15	Being able to apply the concept of coordinates to Calculating building height and building slope	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	15%	Understanding coordinates in 3 dimensional (x, y, z)	Lectures	Teacher-centered learning	2 x 50'
				Area intersection			
				Space intersection	Discussion	Student-centered learning	2 x 50'
				Building height counts against references	Exercise	Problem-based learning	2 x 50'
				The slope of the building			
					Assigment 2		
16				End of Semester Evaluation			
			100%				