SEMESTER LEARNING PLAN (SLP)

COURSE NAME	CODE	COURSE GROUP	CREDITS		SEMESTER	Compilation Date
Basic Terrestrial Mapping	CM234103	Surveying and Cadastral	**T=2**	**P=1**	2	-
AUTHORIZATION	**SLP DEVELOPER**		**COURSE GROUP COORDINATOR**		**HEAD OF UNDERGRADUATE PROGRAM**	
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Learning Outcome (LO)	**Expected Learning Outcomes (ELO) that Imposed in the Course**	
	ELO-2	Able to study and utilize science and technology in order to apply it to the areas of expertise in Geodesy and Surveying, Hydrography, Photogrammetry, and Remote Sensing, as well as Geospatial and Land Information, and able to make appropriate decisions from the results of their own work or group work in the form of a final project report or other forms of learning activities whose outcomes are equivalent to the final project through logical, critical, systematic and innovative thinking.
	ELO-4	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.
	ELO-8	Able to compile scientific reports and provide solutions based on leadership, creativity and communication skills as well as being responsible for the work done.
	Course Learning Outcomes (CLO)	
	CLO-1	Able to use survey equipment.
	CLO-2	Able to measure Horizontal Control and calculate, beside plotting the data result
	CLO-3	Able to measure Vertical Control and calculate, beside plotting the data result

	CLO-4	Able to measure levelling, calculation of field data				
		Matrix ELO – CLO				
		CLO	ELO-2	ELO-4	ELO-8	
		CLO-1		V		
		CLO-2	V	V	V	
		CLO-3	V	V	V	
		CLO-4		V		
Course Description	This course explains the basic understanding of mapping, the purpose and objectives of mapping. Besides that it needs to be explained related to the unit system for the purposes of calculating position and height. Next, it is explained the defintion of scale, distance, horizontal angle, vertical angle, coordinate system in a flat plane. The usefulness and various kinds of equipment wether roll meters, measuring signs, theodolite and waterpass, total station. Horizontal positioning methods and calculations: point potioning method, and polygon method. Methods for determining vertical positions and calculations: levelling, long section, cross section, area, barometric, trigonometric and area calculation methods.					
Course Materials	1. Basic understanding of mapping 2. Unit system 3. definition of scale 4. Definition of distance 5. Horizontal angle, vertical angle 6. Coordinate system 7. Measuring equipment 8. Positioning method 9. Horizontal and vertical reference frame 10. Area calculation					
References	**Main References :**					
	1. Francis H. Moffit, Surveying, Intext Educational Publisher 2. Modul ajar Ilmu Ukur Tanah I 3. Modul ajar Ilmu Ukur Tanah II 4. Paul R wolf & Charles D Ghilani, Elementary Surveying, Prentice Hall					

	Additional References :						
		1. Paul R wolf & Charles D Ghilani, Elementary Surveying, Prentice Hall 2. Wolf P & Brinker Russel 1977. Elementary Surveying. Sixth Edition. Toronto					
Lecturer	Ir. Yuwono, MS Akbar Kurniawan, ST, MT Husnul Hidayat, ST, MT Putra Maulida, ST, MT, Ph.D Prof. Mokhamad Nurcahyadi, ST, M.Sc, Ph.D Dr. Muhammad Aldila Syariz, S.T., M.S., Ph.D.						
Prerequisite	No Prerequisite						

Class/ Week	Lesson Learning Outcome (Sub-CLO)	Evaluation		Forms of Learning, Learning methods, Student Assignments/Task, [Estimated time]		Learning Materials [References]	Weight (%)
		Indicator	Criteria	Offline	Online		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Able to explain the concept of terrestrial mapping by using a simple tool that is a compass, meter (roll meter), and prism, as well as the ethics of the mapping profession		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lectures, Teacher-centered learning [1 x 50']		Syllabus Explanation	5%
				Discussion, Student-centered learning [1 x 50']		Lecture regulation	
				Exercise, Problem-based learning [1 x 50']		Introduction to terrestrial mapping	
				Assignment, [ ]		Simple measuring tool	

2	Able to explain unit systems, especially those related to units of length, area, volume, and angle		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lectures, Teacher-centered learning [1 x 50']		Unit of length, area, and volume	10%
				Discussion, Student-centered learning [1 x 50']		Angular units: grade, radians, and degrees	
				Exercise, Problem-based learning [1 x 50']		Angular Conversion	
				Assignment, []		Another unit commonly used	
3 -4	Able to explain the meaning of distance, horizontal and vertical angles, and height differences in relation to terrestrial mapping.		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lectures, Teacher-centered learning [2 x 50']		The distance between two points on a flat plane	10%
				Discussion, Student-centered learning [2 x 50']		Horizontal direction and horizontal angle	
				Exercise, Problem-based learning [2 x 50']		Vertical angles,slope angles, and zenith angles	
				Assignment, []		Difference in height between two points and point height	
5 - 6	Able to explain the functions of goneometry (sine, cosine, tangent) and		Material completeness, depth of explanation, effectiveness of	Lectures, Teacher-centered learning [2 x 50']		Understanding SINUS, COSINUS, and TANGEN in a flat triangle	10%

	positioning with coordinates on a flat plane.		communication, accuracy of attitude	Discussion, Student-centered learning [2 x 50']		Definition of Arcus sine, cosine arcus, and tangent arcus	
				Exercise, Problem-based learning [2 x 50']		Coordinate system on a plane: Cartesian	
				Assignment 1, []		Quadrant definition	
7	Able to explain the procedure for determining horizontal position (binding) in the field along with its calculations.		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lectures, Teacher-centered learning [1 x 50']		Calculate Coordinate (X, Y)	10%
				Discussion, Student-centered learning [1 x 50']		Calculate Coordinate elements	
				Exercise, Problem-based learning [1 x 50']		Binding of the Front	
				Assignment, []			
8	**Mid semester evaluation**						**50%**
9 - 10 - 11	Able to explain the procedure for determining the horizontal position (polygon) in the field along with its calculations		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lectures, Teacher-centered learning [3 x 50']		Polygon Measurement	25%
				Discussion, Student-centered learning [3 x 50']		Polygon Geometry	
				Exercise, Problem-based learning [3 x 50']		Calculation requirements on Polygons	

				Assignment, []		Errors that occur in Polygons	
				, []		Correction to polygons	
				, []		Position Calculate (X, Y) by Polygon	
12 - 13 - 14	Able to explain the procedure for determining the vertical position (waterpass) in the field along with its calculations		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lectures, Teacher-centered learning [3 x 50']		Waterpass Measurement	25%
				Discussion, Student-centered learning [3 x 50']		High and high difference Calculate	
				Exercise, Problem-based learning [3 x 50']		Calculate requirements on the Waterpass	
						Errors that occur at Waterpass	
						Correction of the waterpass	
						elevation and elevation difference Calculate	
15	Able to explain the procedure for determining terrain profile / field situation and their calculations		Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	Lectures, Teacher-centered learning [1 x 50']		Long section profile	5%
				Discussion, Student-centered learning [1 x 50']		Cross section profile	

				Exercise, [1 x 50']		References used	
				Exercise, Problem-based learning [1 x 50']			
				Assignment-2		Profile calculation and depiction	
16	**Final Semester Evaluation / Final Semester Examination**						**100%**