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

PROGRAM	**UNDERGRADUATE**		
COURSE NAME	**Introduction to Photogrammetry**	**CODE**	**RM184414**
SEMESTER	**IV (four)**	**CREDITS**	**3 (three)**
LECTURERS	**Teguh Hariyanto (Coord.)**		
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COURSE MATERIALS	1	Definision and concept of photogrammetry
	2	Basic concept of optics for photogrammetry
	3	Metric and non-metric aerial cameras
	4	Interpretation of photogrammetry
	5	Determination of difference in height with parallax bar
	6	Theory of exterior and interior orientation
	7	Theory of aerial triangulation and bundle adjustment
	8	Basic theory of parallel/cross-eyed viewing in single and stereo images
	9	Mosaic images and plotting
	10	Design of the flight line and number of images
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.
	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.
COURSE LEARNING OUTCOMES	1	Able to explain the concept of light, optical physics, camera, and other tools that support the concept of photogrammetry
	2	Able to explain the theoretical and empirical concepts of photogrammetry
	3	Able to apply the interpretation technique in photogrammetry
	4	Able to apply the concept of analytic photogrammetry in solutions for the orientation processing
	5	Able to design mapping activities in photogrammetry which agrees with term of reference (TOR), for example, creating the flight line and counting number of photos

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 of photogrammetry as a well known technique of mapping for both interpretation (quantitative) and measurement	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	5,00%	1. Basic principle of photogrammetry 2. Concept of optical physics 3. Concept of light	Lecture	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
					Practice	Problem-based learning	1 x 50'
2-3	Able to explain the concept of basic physics in medias of photography, such as camera tools and film media	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	10,00%	1. Basic optics and wave propagation 2. Components of aerial camera, pinhole, and lens	Lecture	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
					Practice	Problem-based learning	1 x 50'
4-5	Able to apply the method of interpreting aerial photos using image interpretation keys	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	10,00%	1. Interpretation 2. Stereoscope	Lecture	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
6	Able to explain the concept of optical physics, for example camera tools and plotter in order to support the concept of stereoscopic image	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	20,00%	1. Basic computation of vertical aerial photography, image coordinate system, and ground coordinate system	Lecture	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
					Practice	Problem-based learning	1 x 50'
7	Able to explain the concept of camera calibration	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	10,00%	1. Parameter calibration, non-metric camera, relative orientation, space intersection, self calibration, and budle adjustment	Lecture	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
					Practice	Problem-based learning	1 x 50'
8	Mid-Semester Evaluation						
9-10	Able to explain the concept of relief displacement and parallax for interior orientation	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	15,00%	1. Concept of relief displacement, basic concept of relief displacement to calculate height and interior orientation data	Lecture	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
					Practice	Problem-based learning	1 x 50'
11-12	Able to find examples and solutions from photogrammetry applications in the field of mapping	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	10,00%	1. Journal of ISPRS, Photogrametria, Elsevier	Lecture	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
					Practice	Problem-based learning	1 x 50'
13-14	Able to do coordinate computation using the principles of vertical aerial photography	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	10,00%	1. Conditions of collinearity, mathematical relationships between the image and ground coordinates 2. Coordinate transformation with the central projection systems	Lecture	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
					Practice	Problem-based learning	1 x 50'
15	Able to design a work of aerial photography	Completeness of material, depth of explanation, effectiveness of communication, accuracy of attitude	10,00%	1. The flow chart of a photogrammetry work, the plan to use types of aerial camera, number of ground control point (GCP) and independent control point (ICP) for the process of aerial triangulation, number of images, strips, and models in photogrammetry	Lecture	Teacher-centered learning	1 x 50'
					Discussion	Student-centered learning	1 x 50'
					Practice	Problem-based learning	1 x 50'
16	Final Semester Evaluation						