DEPARTMENT OF GEOMATICS ENGINEERING
UNDERGRADUATE PROGRAM IN GEOMATICS ENGINEERING
COURSE SYLLABUS

COURSE	Name	Digital Photogrammetry
	Code	RM184520
	Credits	3 (three)
	Semester	V (five)

COURSE DESCRIPTION

The digital photogrammetry course will apply the concepts and procedures of digital photogrammetry as one of methods to produce large scale maps such as base and thematic maps. This course is classified to three different classes. The first class is the measurement with the digital optics (CCD) & CMOS concepts, and the analytic and digital plottings. The second one is 3D transformation using the digital plotting equipment and mathematics models. The last class is data processing to generate the elevation height (Z) using the LIDAR technology.

EXPECTED LEARNING OUTCOME

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,
E	Able to apply information & communication technology and the latest technological developments in the fields of geodesy, surveying, hydrographic, remote sensing, photogrammetry, geographic information systems, 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 OUTCOME

1	Able to explain the concept of physics and digital electro-optics (CCD/CMOS), metric and non-metric digital camera and other tools which support the stereoscopic concept
2	Able to explain theoretically and empirically in the computational photogrammetry with mono and stero digital photos
3	Able to apply the concept of digital photogrammetry in the solutions of digital orientation process by means of mathematics 3D models between image coordinates and object (ground) coordinates to obtain the detail planimetric and height
4	Able to know and apply the concept of the LIDAR technology to generate DEM, DSM, and contour.

COURSE MATERIALS

1	Definition and use of the photogrammetry technique, the basic concept of electro-optics (CCD and CMOS image sensors) for digital cameras
2	Digital camera calibration metric and non-metric with inertial measurement units (IMU)
3	The interior and exterior orientation theory for digital using mathematics 3D models, The theory and application of digital aerial triangulation
4	The theory and application of linear features (e.g straight-lines and conic sections) in digital images
5	The theory and application of LIDAR data to generate DSM, DTM, and DEM, The basic concept of digital photogrammetric workstation (DPW)

PREREQUISITE

1. Introduction to Pohotogrammetry

REFERENCES

A.	Main References
1	Edward, MH,Introduction to Modern Photogrammetry,John Wiley&Sons,2001
2	Fadh Abany,Advanted Photogrametry, Modul Kuliah, 2007
3	Teguh Hariyanto, LIDAR Overview, Modul Kuliah, 2013, Geomatika ITS.
4	G.Konecny, Photogrammetri, 3nd edition, Sprin verlag, 2014.
5	Koerth Sijmons, Introduction on Photogrametry, ITC-Enschede,Holland,2008
B.	Additional References
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