



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

PROGRAM	UNDERGRADUATE		
COURSE NAME	Seabed Imaging and Mapping	CODE	RM184622
SEMESTER	VI (six)	CREDITS	3 (three)
LECTURERS	Danar Guruh Pratono S.T, M.T, Ph.D		
COURSE MATERIALS	1	The concept and scope of the hydrographic survey	
	2	A review of the singlebeam echosounder and its utilization procedures	
	3	Angle resolution and distance resolution on multibeam echosounder	
	4	Various kind of vessel movement above sea level	
	5	Definition, working principle and analysis on multibeam echosounder	
	6	The basic concept of horizontal and vertical data acquisition	
	7	The working principle of the lidar bathy and the working principle	
	8	Making hydrographic survey design	
EXPECTED LEARNING OUTCOMES THAT IMPOSED IN THE COURSE	A	Able to apply mathematics, science, and engineering in the fields of geodesy, surveying, hydrography, remote sensing, photogrammetry, geographic	
	B	Able to design survey and mapping activities using the latest technology in the fields of geodesy, surveying, hydrographic, remote sensing,	
	G	Able to plan, perform and evaluate the process of surveying and mapping activities using the latest technology in the fields of geodesy, surveying,	
COURSE LEARNING OUTCOMES	1	Able to understand the definition of hydrographic surveys in general and their application.	
	2	Able to explain the instrument of hidrographyc data collection using single echoounder and its procedures	
	3	Able to distinguish between angular resolution and range resolution in multibeam echosounders	
	4	Able to understand the reference frame and the orientation of the vessel during the hydrographic survey or when conducting data processing	
	5	Able to understand the analysis of the hydrographic survey instrument, namely multibeam echosounder	
	6	Able to explain the acquisition of vertical and horizontal data in a hydrographic survey	
	7	Able to understand the basic concepts of data acquisition using Bathy Lidar in a hydrographic survey	
	8	Able to create a hydrographic survey design in a certain area	
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)
1-2	Able to understand the definition of hydrographic surveys in general and their application.	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	10%	Syllabus explanation, class regulation	Lectures	Teacher-centered	2 x 50'
				Introduction to hydrographic surveys	Discussion	Student-centered	2 x 50'
				Methodology for carrying out hydrographic surveys	Exercise	Problem-based	2 x 50'
				Hydrographic survey application	Assignment	Assignment 1: Creating the hydrographic	

3-4	Able to understand the analysis of the hydrographic survey instrument, namely multibeam echosounder	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	15%	Definition of Singlebeam echosounder	Lectures	Teacher-centered	2 x 50'
				Procedure for using Singlebeam echosounder	Discussion	Student-centered	2 x 50'
				Difference between singlebeam echosounder and multibeam echosounder	Exercise	Problem-based	
						Assignment 2: Investigate the various	2 x 50'
5 - 6	Able to distinguish between angular resolution and range resolution in multibeam echosounders	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	10%	Angular resolution	Lectures	Teacher-centered	2 x 50'
				Range resolution	Discussion	Student-centered	2 x 50'
					Exercise	Problem-based	2 x 50'
7	Able to understand the reference frame and the orientation of the vessel during the hydrographic	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	10%	Orientation and Heave	Lectures	Teacher-centered	1 x 50'
				Vessel reference frame	Discussion	Student-centered	1 x 50'
					Exercise	Problem-based	1 x 50'
8				Mid semester exam			
9 - 10	Able to understand the analysis of the hydrographic survey instrument, namely multibeam echosounder	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	15%	Multibeam Geometry	Lectures	Problem-based	2 x 50'
				Multibeam bottom detection	Discussion	Teacher-centered	2 x 50'
				Multibeam active compensation	Exercise	Student-centered	2 x 50'
11 - 12	Able to explain the acquisition of vertical and horizontal data in a hydrographic survey	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	10%	horizontal positioning on the ship	Lectures	Problem-based	2 x 50'
				Determination of vertical positions in hydrographic surveys	Discussion	Teacher-centered	2 x 50'
					Exercise	Student-centered	2 x 50'
13	Able to understand the basic concepts of data acquisition using Bathy Lidar in a hydrographic survey	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	10%	Definition of bathy lidar	Lectures	Problem-based	1 x 50'
				The principle of bathy lidar	Discussion	Teacher-centered	1 x 50'
					Exercise	Student-centered	1 x 50'
14-15	Able to create a hydrographic survey design in a certain area	Material completeness, depth of explanation, effectiveness of communication, accuracy of attitude	20%	Creating the design of hidrographic survey plan	Lectures	Problem-based	2 x 50'
					Discussion	Teacher-centered	2 x 50'
					Exercise	Student-centered	2 x 50'
					Assignment	Assignment 3: Creating the proposal	
16				Final semester exam			
TOTAL			100%				