



**INSTITUT TEKNOLOGI SEPULUH NOPEMBER
FACULTY OF CIVIL, PLANNING AND GEO ENGINEERING
DEPARTMENT OF GEOMATICS ENGINEERING
UNDERGRADUATE PROGRAM**

Document Code

SEMESTER LEARNING PLAN (SLP)

COURSE NAME	CODE	COURSE GROUP	CREDITS (SKS)		SEMESTER	Date of Preparation
Ocean Engineering Survey	CM234985	Geomarine	T=2	P=-	Elective Course	-
AUTHORIZATION	SLP Developer		Course Group Coordinator		Head of Study Program	
	Khomsin, S.T., M.T.		Dr. Muhammad Aldila Syariz, S.T., M.S., Ph.D.		Putra Maulida, ST, MT, Ph.D	

Learning Outcomes (LO)	Expected Learning Outcomes (ELO) that Imposed in the Course	
	ELO-5	Able to design survey and mapping activities using the latest technology in the fields of geodesy, surveying, hydrographic, remote sensing, photogrammetry, and cadastral.
	ELO-9	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 Outcomes (CLO)	
	CLO-1	Students are able to explain methods related with ocean mapping.
	CLO-2	Students are able to describe methods of mapping surface sediment and its layer below.
	CLO-3	Students are able to explain survey methods for ocean engineering.
	CLO-4	Students are able to acquire, process, analyze, visualize hydrographic data for coastal and ocean engineering aolication

		Matrix ELO – CLO <table> <tr> <td>CPMK</td><td>ELO-5</td><td>ELO-9</td></tr> <tr> <td>CLO-1</td><td>V</td><td>V</td></tr> <tr> <td>CLO-2</td><td>V</td><td>V</td></tr> <tr> <td>CLO-3</td><td>V</td><td>V</td></tr> <tr> <td>CLO-4</td><td>V</td><td>V</td></tr> </table>	CPMK	ELO-5	ELO-9	CLO-1	V	V	CLO-2	V	V	CLO-3	V	V	CLO-4	V	V
CPMK	ELO-5	ELO-9															
CLO-1	V	V															
CLO-2	V	V															
CLO-3	V	V															
CLO-4	V	V															
Course Description	The Marine Engineering Survey course aims to provide an understanding of survey methods used for mapping in marine environments, including surface and subsurface sediment mapping. Students will be equipped with knowledge of various techniques relevant to marine engineering applications, such as hydrography and marine geophysics. In addition, this course offers practical skills in the collection, processing, analysis, and visualization of hydrographic data that can be applied in coastal and marine areas. Students are expected to integrate various survey methods to produce accurate and useful data for marine engineering projects.																
Course Materials	1. Introduction - Course Overview 2. Review of MBES (Multibeam Echo Sounder) 3. Side Scan Sonar 4. Bathymetric Side Scan Sonar 5. Sub-Bottom Profiler 6. Submarine Cable and Pipeline Planning 7. Harbor and Jetty Construction Planning 8. Offshore Oil and Gas Exploration and Development 9. Marine Engineering 10. Data Processing and Analysis																
References	Main:																
	Additional :																
	-																
Lecturer	Danar Guruh Pratomo, S.T., M.T., Ph.D. Dr. Khomsin, S.T., M.T. Dr. Muhammad Aldila Syariz, S.T., M.S., Ph.D.																
Prerequisite	Penginderaan Dasar Laut																

Class/ Week	Lesson Learning Outcome (Sub-CLO)	Evaluation		Forms of Learning, Learning methods, Student Assignments/Task, [Estimated Time]		Learning Materials [References]	Weight (%)
		Indicators	Criteria and Form	Offline	Online		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Students are able to understand the purpose, scope, and importance of marine engineering surveys in various marine applications.	1. Accuracy in explaining the basic material of marine engineering. 2. Understanding related to marine applications.	1. Completeness of the material 2. Depth of explanation and effectiveness of communication	1. Lecture [1 x 50'] 2. Discussion [1 x 50']		Learning Material: Introduction to Marine Engineering, Scope, and Applications in Marine Surveying.	5
2	Students were able to explain the working principle and application of Multibeam Echosounder (MBES) in bathymetric mapping.	1. Accuracy in explaining the working principle of MBES. 2. Precision in application examples.	1. Completeness of the material 2. Depth of explanation and effectiveness of communication	1. Lecture [2 x 50'] 2. Discussion [1 x 50'] 3. Task [1 x 50']		Learning Material: Working Principles of Multibeam Echosounder (MBES) in Bathymetry Mapping.	10
3 - 4	Students were able to explain the working principle and application of Multibeam Echosounder (MBES) in bathymetric mapping.	1. Accuracy of understanding the MBES application. 2. Ability to simulate MBES tools.	1. Completeness of the material 2. Depth of explanation and effectiveness of communication	1. Lecture [2 x 50'] 2. Discussion [1 x 50'] Task [1 x 50']		Learning Material: MBES Application and Simulation Tools for Bathymetry Mapping.	10

5	Students were able to explain the use of Bathymetric Side Scan Sonar in more detailed bathymetric mapping and seafloor geological analysis.	1. Accuracy in explaining the concept and function of Bathymetric Side Scan Sonar.2. Understanding of applications in marine surveys.	1. Completeness of the material 2. Depth of explanation and effectiveness of communication	1. Lecture [2 x 50'] 2. Discussion [1 x 50'] 3. Task [1 x 50']		Learning Material: Use of Bathymetric Side Scan Sonar for Seafloor Geological Mapping.	5
6-7	Students are able to operate the Sub-Bottom Profiler to map the sub-sea surface and analyze the underwater geological structure.	1. Accuracy explains the working principle of the Sub-Bottom Profiler.2. Ability to simulate tools and analyze data.	1. Completeness of the material 2. Depth of explanation and effectiveness of communication	1. Lecture [2 x 50'] 2. Discussion [2 x 50']		Learning Material: Sub-Bottom Profiler and Mapping of Underwater Geological Structures.	10
8	Midterm Evaluation / Midterm Exam						50
9	Students are able to plan the placement and installation of submarine cables and pipes according to geographical conditions and the seabed environment.	1. Accuracy of planning the installation of submarine cables and pipes.2. An understanding of the	1. Completeness of the material 2. Depth of explanation and effectiveness of communication	1. Lecture [2 x 50'] 2. Discussion, Task [1 x 50'] 3. Response [1 x 50']		Learning Material: Placement of Submarine Cable and Pipe Installations Based on Geographical Conditions.	10

		geographical conditions of the ocean and its environmental impact.					
10-11	Students are able to explain the process of planning and construction of ports and wharves by considering engineering and marine aspects.	1. Accuracy in explaining the steps of port and dock planning.2. Understanding of environmental impacts and aspects of marine engineering.	1. Completeness of the material 2. Depth of explanation and effectiveness of communication	1. Lecture [2 x 50'] 2. Discussion, Task [1 x 50'] 3. Response/exercise [1 x 50']		Learning Material: Port Planning and Environmental Influence on Marine Engineering Aspects.	10
12	Students are able to explain the process of exploration and development of offshore oil and gas fields, including the technology used.	1. Accurately explaining the oil and gas exploration process.2. Understanding of the technology used in offshore exploration.	1. Completeness of the material 2. Depth of explanation and effectiveness of communication	1. Lecture [2 x 50'] 2. Discussion, Task [1 x 50'] 3. Response/exercise [1 x 50']		Learning Material: The Process of Offshore Oil and Gas Field Exploration.	10
13	Students are able to apply marine engineering to a wide range of	1. Accuracy in applying marine	1. Completeness of the material	1. Lecture [1 x 50'] 2. Discussion, Task [1 x 50']		Learning Material: Coastal Engineering and Coastal Conservation.	10

	engineering applications in coastal and marine areas, including management and conservation.	techniques.2 . Ability to explain the application of marine engineering in coastal engineering.	2. Depth of explanation and effectiveness of communication				
14 - 15	Students are able to process, analyze, and visualize hydrographic survey data and marine geophysics to produce comprehensive reports.	1. Accuracy in conducting survey data analysis.2. Ability to compile comprehensive and clear reports.	1. Completeness of the material 2. Depth of explanation and effectiveness of communication	1. Lecture [1 x 50'] 2. Discussion, Task [1 x 50']		Learning Material: Hydrographic Data Analysis and Geophysical Visualization for Marine Survey.	10
16	Final Semester Evaluation / Final Semester Examination						100