



UNIVERSITAS PENDIDIKAN INDONESIA

SEMESTER LEARNING PLAN (RPS)

COURSE INFORMATION

Course Name	Course Code	Credits	Workload	Course Group	Semester	Prerequisite Course	Date of Issue
HYDROGRAPHIC SURVEY	SA407	3	135	Core Expertise Study Program	4	Land Surveying, Terrestrial Mapping, GNSS	2025-09-09 11:26:56

Prepared by	Reviewed by	Approved by
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COURSE DESCRIPTION AND LEARNING OUTCOMES

Course Description	This course is offered to students of the Geographic Information Science study program, covering the fundamental concepts of hydrographic mapping, horizontal positioning at sea, and seabed depth measurement methods for bathymetric map production using depth measuring instruments (hydro-acoustic) as well as vertical datum determination. Other surveys that support bathymetric mapping activities and their technological development are also studied in this course.		
Program Learning Outcome Assigned in the Course	1	S6 Collaborating and demonstrating social sensitivity and concern for society and the environment;	
	2	S9 Demonstrating a responsible attitude toward work within one's field of expertise independently;	
	3	P1 Mastering the theoretical concepts of surveying their activities resources (natural, social, their cultural), as well as possessing the skills to apply various surveying and resource mapping methods (natural, social, and cultural)	
	4	KU2 Capable of demonstrating high-quality and measurable performance;	
	5	KU3 Capable of solving work problems that match the nature their context support the applied match of expertise, based on logical, innovative, and responsible thinking, and independently accountable for the results;	
	6	KU4 Capable of compiling accurate and their reports on work results their processes, as well as communicating work effectively to other parties who require them;	
	7	KK1 Capable of operating surveying and mapping equipment.	
	8	KK3 Capable of processing survey data in the field of resources (natural, social, and cultural) and presenting it in the form of maps.	
	9	KK6 Capable of reporting the results of surveying, mapping, and geographic information in the field of resources (natural, social, and cultural).	
	10	KK7 Capable of keeping pace with developments in science and technology related to surveying, mapping, and geographic information.	
Course Learning Outcome (CPMK)	1	Students are expected to understand the principles of marine positioning (S6, P1, KU2, KK1)	
	2	Students are able to implement optical and acoustic positioning methods to determine elevation values (S6, P1, KU2, KK1)	
	3	Students are able to collaborate in planning bathymetric survey activities (S6, S9, P1, KU3, KK7)	
	4	Students are able to conduct bathymetric survey data acquisition (S9, KU2, KK1)	
	5	Students are able to perform bathymetric data processing (S9, KU2, KK3)	
	6	Students are able to produce hydrographic survey reports (S9, KU2, KK6)	
Sub-CPMK	1	CPMK - 1	Students are able to understand the principles of positioning at sea

	2	CPMK - 2	Students are able to implement optical vertical datum positioning work to obtain elevation values
	3	CPMK - 4	Students are able to conduct bathymetric survey and
	4	CPMK - 5	Students are able to perform and
	5	CPMK - 3	Students are able to collaborate in planning bathymetric and
	6	CPMK - 6	Students are able to compile hydrographic survey reports and present them
Course Materials	1	Introduction to Hydrography	
	2	Marine Positioning	
	3	Underwater Acoustic Positioning	
	4	Vertical Datum	
	5	Methods and Techniques of Depth Sounding	
	6	Physical Properties of	
	7	Tidal Patterns	
	8	Arus/Ocean Circulation	
	9	Wave	
	10	Wave Wave	
	11	Hydrographic Survey Hydrography	
Learning outcomes demonstrated at the end of the course *)	Exposition of hydrography practicum results		
Learning Strategy	✓	Case Method	
		Team based Project	
		Others	
Learning Stages	Learning is conducted through face-to-face sessions, tutorials, practicum, and exposition		
References	1	Poerbandono dan Djunarsjah, E., 2005. “Survei Hidrografi”. Aditama, Bandung.	
	2	Lekkerkerk, Huibert-Jan, dkk. 2006. Handbook of Offshore Surveying. London: Clarkson Research Service Limited	

3	Djunarsjah, Eka.2003. Hidrografi I. Bandung: Penerbit ITB
4	Djunarsjah, Eka.2003. Hidrografi II. Bandung: Penerbit ITB
5	http://woodshole.er.usgs.gov/operations/sfmapping/bathy.htm . Bathymetry systems.

RENCANA PEMBELAJARAN

Week -	Sub-CPMK	Learning Indicator	Course Material	Assessment		Learning Method		Duration (hours)	Reference	Access Time
				Assessment Methode (test/non-test)	Assessment Weighting (%)	Synchronous	Asynchronous			
1	Students are able to understand the principles of positioning at sea	Students are able to understand the fundamental concepts of hydrographic surveying	Introduction to Hydrography	Others	5	face-to-face	-	3	1	04-02-2025 08:40
2	Students are able to understand the principles of positioning at sea	Students are able to understand the fundamental concepts of positioning	Marine Positioning	Others	5	face-to-face	-	3	1	11-02-2025 08:40
3	Students are able to understand the principles of positioning at sea	Students are able to understand the principles of positioning at sea	Underwater Positioning	Others	5	face-to-face	-	3	1	18-02-2025 08:40
4	Students are able to implement optical and acoustic positioning methods to determine elevation values	Students are able to implement positioning the applied to its vertical datum	Vertical Datum	Essay	5	face-to-face	Independent Assignment	3	4	25-02-2025 08:40
5	Students are able to implement optical and acoustic positioning methods to determine elevation values	Students are able to understand positioning methods	provides and Depth Sounding Techniques	Essay	5	face-to-face	-	3	1	04-03-2025 08:40
6	Students are able to conduct bathymetric survey data acquisition	Students are able to understand the principles of single-beam echo sounding (SBES)	provides and Depth Sounding Techniques	Others	5	face-to-face	-	3	1	11-03-2025 08:40

7	Students are able to conduct bathymetric survey data acquisition	Students are able to understand the operational principles of multibeam echo sounding (MBES)	provides and Depth Sounding Techniques	Others	5	face-to-face	-	3	1	18-03-2025 08:40
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Week -	Sub-CPMK	Learning Indicator	Course Material	Assessment		Learning Method		Duration (hours)	Reference	Access Time
				Assessment Method (test/non-test)	Assessment Weighting (%)	Synchronous	Asynchronous			
8	Students are able to conduct bathymetric survey data acquisition	Students are able to apply to apply principles in a case study through to data acquisition	provides and Depth Sounding Techniques	Essay	5	face-to-face	-	3	1	25-03-2025 08:40
9	Students are able to conduct bathymetric survey data acquisition	Students understand the physical properties of seawater	Physical Properties of	Others	5	face-to-face	-	3	1	01-04-2025 08:40
10	Students are able to understand the principles of positioning at sea	Students are able to understand tidal observation	Tidal Patterns	Others	5	face-to-face	-	3	1	08-04-2025 08:40
11	Students are able to perform bathymetric data processing	Students are able to perform tidal analysis and prediction	Tidal Patterns	Others	5	face-to-face	-	3	1	15-04-2025 08:40
12	Students are able to perform bathymetric data processing	Students are able to understand ocean current data processing	Ocean Current/Circulation	Others	5	face-to-face	-	3	1	22-04-2025 08:40
13	Students are able to perform bathymetric data processing	Students are able to process wave data	Wave	Others	5	face-to-face	-	3	1	25-04-2025 08:40
14	Students are able to perform bathymetric data processing	Students are able to conduct measurement their bathymetric of survey hydrographic	Wave Measurement	Others	5	face-to-face	-	3	4	06-05-2025 08:40
15	Students are able to collaborate to apply planning bathymetric survey activities	Students are able to plan through to the visualization of bathymetric survey data	Hydrographic Survey Planning	Others	5	face-to-face	-	3	1	13-05-2025 08:40
16	Students are able to compile reports on and hydrographic and present them	Students are able to compile a report, justify the findings, and present the results of hydrographic survey analysis	Hydrographic Survey Planning	Performance	25	face-to-face	-	3	1	20-05-2025 08:40

STUDENT LEARNING TIME (WORKLOAD)

LEARNING	ACTIVITIES		SYNSCHRONOUS (Face-to-Face / Virtual Meeting)	ASYNCHRONOUS (Structured / Independent)	STUDENT LEARNING PREPARATION	TOTAL STUDENT LEARNING AND INSTRUCTION TIME
	Lectures/Responses/Tutorials		12 x 60 minutes = 720 minutes	-x-	-x-	720 minutes (12.0 hours)
	Project-based learning		6 x 60 minutes = 360 minutes	16 x 60 minutes = 960 minutes	-x-	1320 minutes (22.0 hours)
	Discussion (case-based learning)		6 x 60 minutes = 360 minutes	6 x 60 minutes = 360 minutes	6 x 60 minutes = 360 minutes	1080 minutes (18.0 hours)
	TOTAL					3120 minutes (52.0 hours)
ASSESSMENT		Continuous Assessment				
		Participation During Learning	12 x 60 minutes = 720 minutes	-x-	-x-	720 minutes (12.0 hours)
		Project Completion	7 x 60 minutes = 420 minutes	14 x 60 minutes = 840 minutes	14 x 60 minutes = 840 minutes	2100 minutes (35.0 hours)
		Assignments	6 x 60 minutes = 360 minutes	10 x 60 minutes = 600 minutes	8 x 60 minutes = 480 minutes	1440 minutes (24.0 hours)
		Quizzes	4 x 60 minutes = 240 minutes	-x-	2 x 60 minutes = 120 minutes	360 minutes (6.0 hours)
		Formative				120 minutes (2.0 hours)
		Summative				240 minutes (4.0 hours)
	TOTAL					4980 minutes (83.0 hours)
TOTAL WORKLOAD						8100 minutes (135 Jam)
TOTAL IDEAL HOURS						135 Hours
CREDITS						3
CONFORMITY WITH THE NUMBER OF CREDITS						APPROPRIATE

CPMK ASSESSMENT CRITERIA

No	CPMK	CPL										TAXONOMY	Weight	CPMK ACHIEVEMENT CRITERIA
		CPL-1	CPL-2	CPL-3	CPL-4	CPL-5	CPL-6	CPL-7	CPL-8	CPL-9	CPL-10			
1	Students are expected to are able to the principles of marine positioning (S6, P1, KU2, KK1)											0	20	75% of all students obtain a minimum score of 75 (scale of 100)
2	Students are able to implement positioning positioning work to obtain elevation to determine elevation values (S6, P1, KU2, KK1)											0	10	75% of all students obtain a minimum score of 75 (scale of 100)
3	Students are able to collaborate in planning mapping surveying activities (S6, S9, P1, KU3, KK7)											0	5	75% of all students obtain a minimum score of 75 (scale of 100)
4	Students are able to conduct bathymetric survey data acquisition (S9, KU2, KK1)											0	20	75% of all students obtain a minimum score of 75 (scale of 100)
5	Students are able to conduct bathymetric data processing (S9, KU2, KK3)											0	20	75% of all students obtain a minimum score of 75 (scale of 100)
6	Students are able to produce accurate and reports (S9, KU2, KK6)											0	25	75% of all students obtain a minimum score of 75 (scale of 100)

COLLABORATIVE ASSIGNMENT DESIGN

ASSIGNMENT TITLE	Analysis of Hydrographic Survey Hydrography
LEARNING METHOD	Case Method
TIME	
ASSESSMENT WEIGHT	60
SUB-CPMK	Students are able to compile hydrographic survey reports and present them

ASSIGNMENT DESCRIPTION
Students are able to plan through to justify the activities conducted during the hydrographic survey practicum results
TASK COMPLETION STEPS
Detailed in the module
DETAILS OF EXPECTED OUTPUTS
Maps, reports, presentations, assessment during practicum, and exposition
INDICATORS, CRITERIA, AND ASSESSMENT WEIGHT

In hydrographic surveys, indicators, criteria, their assessment weights are important elements for evaluating the quality and survey results. The are provides an explanation of indicators, criteria, their weights typically used in hydrographic surveys:

1. Hydrographic Survey Hydrography

Indicators are parameters or variables used to measure hydrographic survey results. Common indicators include the following:

- **Positional Accuracy:** Measuring the accuracy of collected data in determining the positions of measurement points on the sea or river surface.
- **Resolution:** The capability of the system to distinguish minor changes in depth or position, which affects the precision of survey results. **Detectable Detectable**
- **support (Minimum the minimum depth Measurable) the minimum depth Assessing**the minimum depth detectable instruments the support used. match support
- **Data Consistency:** Measuring the consistency of measurement results under various temporal and spatial conditions.
- **surveys Speed:** Assessing how quickly a survey can be conducted without compromising data quality.

2. Assessment Criteria

Criteria are standards or guidelines used to evaluate survey results. Criteria commonly applied in hydrographic surveys include:

- **Precision**the minimum depth Evaluating the precision and accuracy of depth or positional measurements, relating to potential errors in measurements.
- **Equipment Reliability:** Assessing the performance of survey equipment (e.g., echo sounder, GPS, sonar) in providing accurate and reliable data.
- **Completeness Completeness:** The extent to which data covers the entire survey area and depth variations present.
- **Compliance with Standards and Procedures:** Assessing whether the survey is conducted in accordance with applicable technical standards and guidelines.
- **Verification and Calibration:** The process of data verification to ensure accuracy and calibration of equipment used.

3. Assessment Weights

Weights weights assigned for each criterion based on its importance criterion determining to apply quality the quality and survey results. Weights weights are typically defined by the organization or body conducting the survey. The following are example weights for selected criteria:

- **Positional** : Weight 30%
- **Resolution:** Weight 20%
- **Minimum Detectable Depth:** Weight 15%
- **Equipment Reliability:** Weight 20%
- **Completeness Completeness:** Weight 10%
- **Compliance with Standards and Procedures:** Weight 5%

With these weights, each criterion is assessed based on its contribution to the overall success of the survey results.

Final Assessment

The final assessment result is match by summing support assigned for each criterion support criterion, multiplied by match assessment support This method provides weights assessment of hydrographic survey quality and whether the collected data meets the required standards.

IMPLEMENTATION SCHEDULE

Note: The number of days in one semester is $16 \times 7 = 112$ days. The implementation schedule may be determined based on the day count

Activities	Implementation Time
Hydrographic Survey Hydrography	6x120 minutes

OTHERS

REFERENCES

1. Poerbandono dan Djunarsjah, E., 2005. "Survei Hidrografi". Aditama, Bandung.
2. Lekkerkerk, Huibert-Jan, dkk. 2006. Handbook of Offshore Surveying. London: Clarkson Research Service Limited
3. Djunarsjah, Eka.2003. Hidrografi I. Bandung: Penerbit ITB
4. Djunarsjah, Eka.2003. Hidrografi II. Bandung: Penerbit ITB
5. <http://woodshole.er.usgs.gov/operations/sfmapping/bathy.htm>. Bathymetry systems.