

SEMESTER COURSE PLAN

**GEOSPATIAL DATABASE (P4) COURSES
(23H06122502)**



TEACHING TEAM

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STUDI PROGRAM OF GEOPHYSICS - S1
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
HASANUDDIN UNIVERSITY
MAKASSAR
2025

**STUDY PROGRAM OF GEOFISIKA - S1
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
HASANUDDIN UNIVERSITY**

Vision

Become a program Reliable studies in the field of geophysics to produce superior graduates and mastering science, technology, arts and culture based on BMI in 2030.

Vision Strategy

Mission

Based on the Vision above, the Geophysics Study Program has a mission:

1. Improving the quality of education to produce graduates who are competitive, able to work independently and in groups in implementing and developing BMI science and technology;
2. Carrying out research to produce reliable and competitive scientific work oriented towards the scientific development of solid geophysics, marine geophysics, geoinformatics and hydro-meteorology;
3. Disseminate the results of applied research, action studies and appropriate technology packages in synergistic and accelerated productive activities to improve the quality of life of the community.

Graduate Profiles

Educators in the Field of Geophysics; meteorologist; geomaths; oceanographer; exploration geophysicist; seismologist ; geophysical entrepreneur.

PLO charged to courses

CPL-4 (P1) - Mastering theoretical concepts of land, sea and geophysics atmosphere, principles of exploration, and design exploration necessary for identification and mapping natural resources and natural disaster mitigation;

CPL-14 (KK4) - Able to investigate potential natural resources and utilize appropriate information and computing technology-based instruments to carry out natural resource exploration and natural disaster mitigation activities

Course Learning Outcomes (CLO)

CPMK-1: Students are able to implement spatial analysis using GIS tools into the design of solving spatial problems and as support for decision making (CPL4 dan CPL14)

Sub-CLO

Sub CPMK-1: Able to explain the basic concepts of the geospatial database and its role in the management of spatial information. (CPMK-1)

Sub CPMK-2: Able to operate DBMS Geospatial to create, modify, and manage tables and spatial data. (CPMK-1)

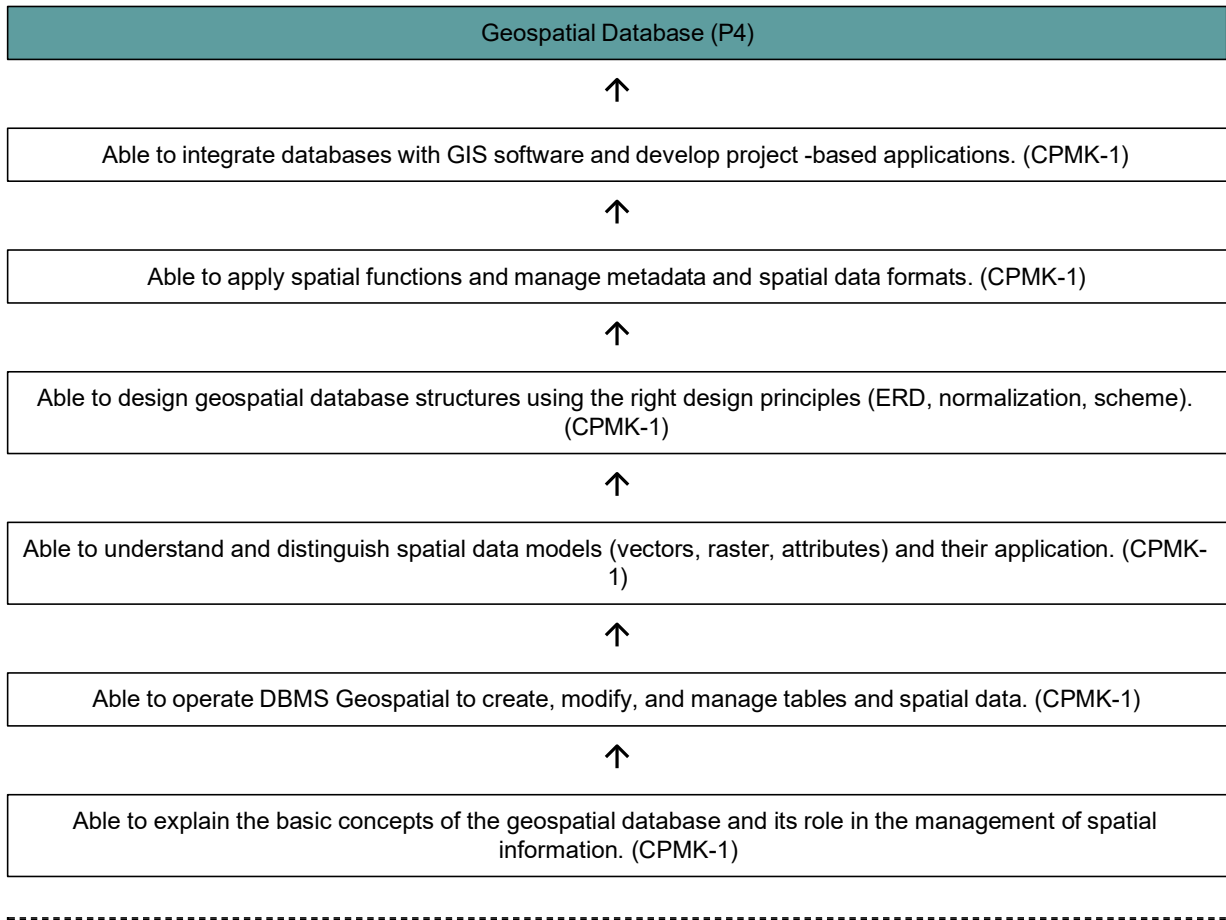
Sub CPMK-3: Able to understand and distinguish spatial data models (vectors, raster, attributes) and their application. (CPMK-1)

Sub CPMK-4: Able to design geospatial database structures using the right design principles (ERD, normalization, scheme). (CPMK-1)

Sub CPMK-5: Able to apply spatial functions and manage metadata and spatial data formats. (CPMK-1)

Sub CPMK-6: Able to integrate databases with GIS software and develop project -based applications. (CPMK-1)

Learning Analytics





HASANUDDIN UNIVERSITY

FAKULTY OF MATHEMATICS AND NATURAL SCIENCES

STUDY PROGRAM OF GEOPHYSICS - S1

SEMESTER LEARNING PLAN

Course		Code	Course Group	Credits	SEMESTER	Compilation Date
Geospatial Database (P4)		23H06122502		2	4	1 Juli 2025
AUTHORITY		SLP Developer Lecturer	Coordinator		Head of Study Program	
		Dr. Samsu Arif, M.Si., Aswar Syafnur, S.Si., M.Eng	Dr. Samsu Arif, M.Si.		Dr. Muhammad Alimuddin, Eng.	
Learning Outcomes Course	SLOs that are imposed on the course					
	SLO-4:	Menguasai konsep teoritis Geofisika darat, laut dan atmosfer, prinsip-prinsip eksplorasi, dan perancangan eksplorasi yang diperlukan untuk identifikasi dan pemetaan SDA serta mitigasi bencana alam;				
	SLO-14:	Mampu menyelidiki potensial sumberdaya alam dan memanfaatkan instrumen yang berbasis teknologi informasi dan komputasi yang sesuai untuk melakukan aktivitas eksplorasi SDA dan Mitigasi Bencana Alam				
	SLO ⇒ Course Learning Outcomes					
	After completing this course, it is expected:					
	SLO-4	CLO-1: Students are able to implement spatial analysis using GIS tools into the design of solving spatial problems and as support for decision making				
	SLO-14	CLO-1: Students are able to implement spatial analysis using GIS tools into the design of solving spatial problems and as support for decision making				
	CLO ⇒ Sub-CLO					
	CLO-1	Sub-CLO-1:Able to explain the basic concepts of the geospatial database and its role in the management of spatial information.				
		Sub-CLO-2:Able to operate DBMS Geospatial to create, modify, and manage tables and spatial data.				
		Sub-CLO-3:Able to understand and distinguish spatial data models (vectors, raster, attributes) and their application.				
		Sub-CLO-4:Able to design geospatial database structures using the right design principles (ERD, normalization, scheme).				
		Sub-CLO-5:Able to apply spatial functions and manage metadata and spatial data formats.				
		Sub-CLO-6:Able to integrate databases with GIS software and develop project -based applications.				
	Correlation between SLOs/CLOs to Sub-CLOs					

SLOs that are charged on the Course	CPMK	SUB CPMK	Form of Assessment*		Weight	Value	Student Score
			Formative	Sumative			
				Project/Case Study			
SLO-14	CLO-1	SUB-CLO-1	Participation and Participation	10	10		
SLO-14	CLO-1	SUB-CLO-2	Participation and Participation	10	10		
SLO-14	CLO-1	SUB-CLO-3	Participation and Participation	10	10		
SLO-14	CLO-1	SUB-CLO-4	Participation, Participation and Participation	19	19		
SLO-14	CLO-1	SUB-CLO-5	Participation, Participation and Participation	19	19		
SLO-14	CLO-1	SUB-CLO-6	Participation, Participation, Participation and Participation	32	32		
				100	100		
Course Description	The Geospatial Database course is a course that will study database concepts and database management systems, including spatial database concepts and spatial database management as well as implementing spatial database concepts in studies.						
Learning Materials/Subjects	1. Database System Concepts. 2. Database System Operations. 3. Data Models and Their History. 4. Database Design. 5. Integration with GIS.						
Reference	Main References						
	1. Howe, D, R, Data Analysis for Data Base Design, Edward Arnold, 1989 2. Ramakhrisnan, R., Gerkhe, J. Database Management System, 2000 3..Rachmadi, Tri, Database Systems, 2020						
	Additional References						
	STMIK PalComTech, Database Management System						
Teaching Team	Dr. Samsu Arif, M.Si., Aswar Syafnur, S.Si., M.Eng						
Course requirement							

Week	Sub CPMK (End-of-stage learning ability)	Penilaian (Assesment)		Learning Forms and Methods [time estimate]		Content	Weight of Assessment (%)
		Indicator	Techniques & Criteria	Offline	Online		
1	2	3	4	5	6	7	8
1	Able to explain the basic concepts of the geospatial database and its role in the management of spatial information. (CPMK-1)	Formative: Able to explain the meaning and main components of a database system. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (5) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Understanding, components and benefits of a database system.	5
2	Able to explain the basic concepts of the geospatial database and its role in the management of spatial information. (CPMK-1)	Formative: Able to explain the role of databases in spatial data management. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (5) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		The role of databases in managing spatial data.	5

3	Able to operate DBMS Geospatial to create, modify, and manage tables and spatial data. (CPMK-1)	Formative: Able to create and modify table structures. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (5) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Creation of table structure.	5
4	Able to operate DBMS Geospatial to create, modify, and manage tables and spatial data. (CPMK-1)	Formative: Able to input and update spatial data. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (5) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Input and update spatial data.	5

5	Able to understand and distinguish spatial data models (vectors, raster, attributes) and their application. (CPMK-1)	Formative: Able to explain the development of database systems. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (5) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Development of database systems from time to time.	5
6	Able to understand and distinguish spatial data models (vectors, raster, attributes) and their application. (CPMK-1)	Formative: Able to differentiate between spatial and non-spatial data models. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (5) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Data model relational, spatial, and non-spatial.	5

7	Able to design geospatial database structures using the right design principles (ERD, normalization, scheme). (CPMK-1)	Formative: Able to create simple database schema designs. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (5) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Database schema design.	5
8	Able to design geospatial database structures using the right design principles (ERD, normalization, scheme). (CPMK-1)	Formative: Able to normalize table structures. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (5) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Normalization of data.	5

9	Able to apply spatial functions and manage metadata and spatial data formats. (CPMK-1)	Formative: Able to use basic spatial functions in databases. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (5) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Basic spatial functions.	5
10	Able to apply spatial functions and manage metadata and spatial data formats. (CPMK-1)	Formative: Able to manage spatial data metadata. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (5) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Spatial data metadata management.	5

11	Able to integrate databases with GIS software and develop project -based applications. (CPMK-1)	Formative: Able to connect databases with GIS devices. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (5) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Database connection to GIS device.	5
12	Able to integrate databases with GIS software and develop project -based applications. (CPMK-1)	Formative: Able to display spatial data from databases in GIS. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (5) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Displays data spatial in GIS.	5

13	Able to design geospatial database structures using the right design principles (ERD, normalization, scheme). (CPMK-1)	Formative: Able to design databases according to specific needs. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (9) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Preparation of geospatial database project design.	9
14	Able to apply spatial functions and manage metadata and spatial data formats. (CPMK-1)	Formative: Able to fill in data and test the database. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (9) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Database filling and testing.	9

15	Able to integrate databases with GIS software and develop project -based applications. (CPMK-1)	Formative: Able to integrate databases into GIS. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (9) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Database integration and optimization in GIS.	9
16	Able to integrate databases with GIS software and develop project -based applications. (CPMK-1)	Formative: Able to present project results and evaluation. Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (13) dinilai dengan rubrik 4 Assessment Technique: Non Test	Studying: Case Study (Case Study) 3 x 1 x 50" Practicum, Studio Practice, Workshop Practice, Field Practice: Case Study (Case Study) 1 x 1 x 170"		Project presentation, evaluation and feedback.	13
							100

Matrix of SLO, CLO, and Assessment Method

SLO / CLO	CLO-1
CPL-4 (P1)	Project/Case Study (Weight 10%) Project/Case Study (Weight 10%) Project/Case Study (Weight 10%) Project/Case Study (Weight 19%) Project/Case Study (Weight 19%) Project/Case Study (Weight 32%)
CPL-14 (KK4)	Project/Case Study (Weight 10%) Project/Case Study (Weight 10%) Project/Case Study (Weight 10%) Project/Case Study (Weight 19%) Project/Case Study (Weight 19%) Project/Case Study (Weight 32%)

Evaluation Type and Assessment Weight

Type	Assessment Weight
Project/Case Study	100
Total	100

Assessment and Evaluation of Student Achievement of CLOs

SLOs that are charged on the Course	CLO	SUB CLO	Form of Assessment*		Weight	Value	Student Score
			Formative	Sumative			
				Project/Case Study			
SLO-14	CLO-1	SUB-CLO-1	Participation and Participation	10	10		
SLO-14	CLO-1	SUB-CLO-2	Participation and Participation	10	10		
SLO-14	CLO-1	SUB-CLO-3	Participation and Participation	10	10		
SLO-14	CLO-1	SUB-CLO-4	Participation, Participation and Participation	19	19		
SLO-14	CLO-1	SUB-CLO-5	Participation, Participation and Participation	19	19		
SLO-14	CLO-1	SUB-CLO-6	Participation, Participation, Participation and Participation	32	32		
				100	100		

Lampiran Rubrik 4 | Rubrik Praktikum

Tabel 6. 4 Rubrik Praktikum

Kegiatan	:	Mahasiswa mampu melaksanakan kegiatan Praktikum sesuai Modul Percobaan yang diberikan.	
Kriteria Penilaian	:	1. Penyediaan alat dan bahan	10 %
		2. Merangkai alat dan bahadengan benar, rapi dan memperhatikan keselamatan kerja	10 %
		3. Pengamatan/Pengambilan Data percobaan	20 %
		4. Pengolahan data hasil percobaan	20 %
		5. Menyimpulkan hasil percobaan	10 %
		6. Penyusunan laporan hasil lpercobaan dalam bentuk tulisan yang rapi	30 %

Kriteria/ Dimensi	Penilaian mahasiswa				
	Sangat Baik	Baik	Cukup	Kurang	Sangat kurang
	Skor ≥ 85	Skor 71 - 84	Skor 61 - 70	Skor 51 – 60	Skor 41 - 50
Penyediaan alat dan bahan	Menyiapkan alat dan bahan dengan rapi dan lengkap serta mengembalikannya dalam keadaan lengkap dan baik	Menyiapkan alat dan bahan dengan rapi dan lengkap serta mengembalikannya dengan lengkap namun keadaannya kurang rapi	Menyiapkan alat dan bahan dengan lengkap dan rapi, namun tidak mengembalikannya dalam keadaan lengkap dan baik	Menyiapkan alat dan bahan dengan lengkap namun tidak rapi serta mengembalikannya dalam keadaan tidak lengkap dan dalam keadaan kurang baik	Tidak menyiapkan alat dan bahan praktikum
Merangkai alat dan bahan dengan benar, rapi dan memperhatikan keselamatan kerja	Rangkaian alat benar, rapi, dan memperhatikan keselamatan	Rangkaian alat benar, rapi, dan memperhatikan keselamatan kerja	Rangkaian alat benar, rapi namun tidak memperhatikan keselamatan kerja	Rangkaian alat benar, tetapi tidak rapi	Rangkaian alat tidak benar
Pengamatan/Pengambilan Data	cermat, tepat dan bebas interpretasi	cermat, tidak mengandung tidak tepat	cermat, tepat tetapi mengandung interpretasi	tidak cermat, kurang tepat	tidak cermat, tidak tepat (salah)
Pengolahan data hasil percobaan					
Menyimpulkan hasil percobaan	Kesimpulan sesuai tujuan, singkat, dan logis	Kesimpulan sesuai tujuan, singkat, ada kesimpulan yang tidak sesuai tujuan	Kesimpulan sesuai tujuan, sebagian kesimpulan tidak sesuai tujuan, terlalu panjang	Tidak benar atau tidak sesuai tujuan	Tidak menyimpulkan hasil percobaan
Penyusunan laporan hasil percobaan dalam bentuk tulisan yang rapi	Laporan disajikan/tersusun sistimatis, jelas, dan lengkap serta rapi	Laporan disajikan/tersusun sistimatis, jelas, dan lengkap namun tidak rapi	Laporan disajikan/tersusun kurang sistimatis, kurang jelas namun lengkap	Laporan disajikan/tersusun tidak sistimatis, tidak jelas, dan tidak lengkap	Tidak membuat laporan