

SEMESTER COURSE PLAN

**MATHEMATICAL GEOPHYSICS II COURSES
(23H06120103)**



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-5 (P2) - Mastering Geophysical concepts and principles in applying applied mathematics in the field of Geophysics

CPL-11 (KK1) - Able to apply the principles of mathematics and earth science, as well as the principles of Exploration and Mitigation to solve natural resource exploration and disaster mitigation problems (Exploration natural resources and natural disaster mitigation)

Course Learning Outcomes (CLO)

CPMK-1: Able to apply the use of special functions in ordinary differential equations (ODE) (CPL5)

CPMK-2: Able to solve transformation method problems in geophysical problems (CPL11)

CPMK-3: Able to demonstrate partial differential equations (PDE) in geophysical problems (CPL11)

Sub-CLO

Sub CPMK-1: Able to solve conceptual and application problems of 1st order and higher order ODEs in geophysical mathematical equations (CPMK-1)

Sub CPMK-2: Able to apply concepts and applications of special functions in ODE (CPMK-1)

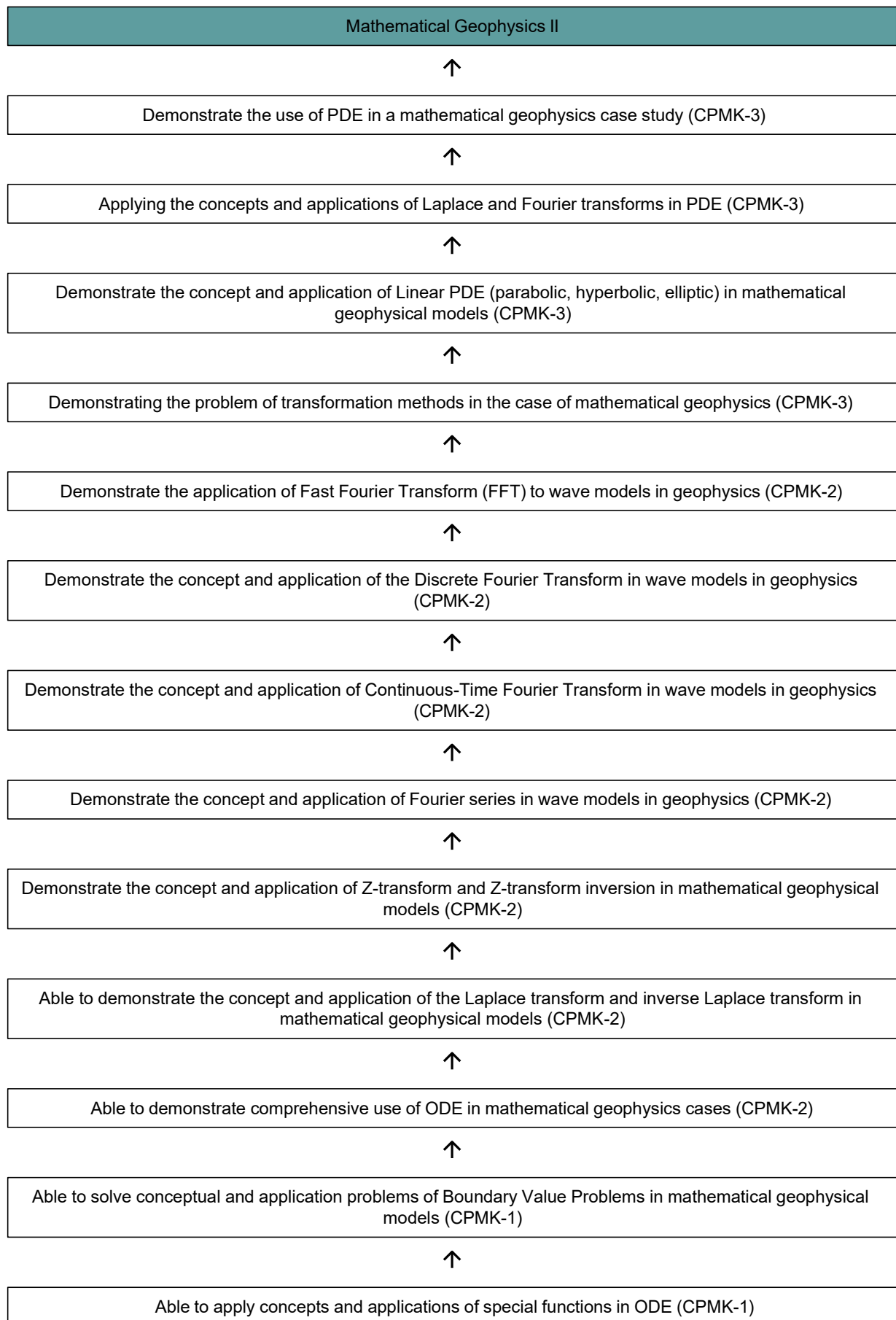
Sub CPMK-3: Able to solve conceptual and application problems of Boundary Value Problems in mathematical geophysical models (CPMK-1)

Sub CPMK-4: Able to demonstrate comprehensive use of ODE in mathematical geophysics cases (CPMK-2)

Sub CPMK-5: Able to demonstrate the concept and application of the Laplace transform and inverse Laplace transform in mathematical geophysical models (CPMK-2)

- Sub CPMK-6: Demonstrate the concept and application of Z-transform and Z-transform inversion in mathematical geophysical models (CPMK-2)
- Sub CPMK-7: Demonstrate the concept and application of Fourier series in wave models in geophysics (CPMK-2)
- Sub CPMK-8: Demonstrate the concept and application of Continuous-Time Fourier Transform in wave models in geophysics (CPMK-2)
- Sub CPMK-9: Demonstrate the concept and application of the Discrete Fourier Transform in wave models in geophysics (CPMK-2)
- Sub CPMK-10: Demonstrate the application of Fast Fourier Transform (FFT) to wave models in geophysics (CPMK-2)
- Sub CPMK-11: Demonstrating the problem of transformation methods in the case of mathematical geophysics (CPMK-3)
- Sub CPMK-12: Demonstrate the concept and application of Linear PDE (parabolic, hyperbolic, elliptic) in mathematical geophysical models (CPMK-3)
- Sub CPMK-13: Applying the concepts and applications of Laplace and Fourier transforms in PDE (CPMK-3)
- Sub CPMK-14: Demonstrate the use of PDE in a mathematical geophysics case study (CPMK-3)

Learning Analytics





Able to solve conceptual and application problems of 1st order and higher order ODEs in geophysical mathematical equations (CPMK-1)

Have passed the course Mathematical Geophysics I



HASANUDDIN UNIVERSITY
FAKULTY OF MATHEMATICS AND NATURAL SCIENCES
STUDY PROGRAM OF GEOPHYSICS - S1
SEMESTER LEARNING PLAN

Course		Code	Course Group	Credits	SEMESTER	Compilation Date
Mathematical Geophysics II		23H06120103		3	3	1 Juli 2025
AUTHORITY		SLP Developer Lecturer		Coordinator		Head of Study Program
		Dr. Muhammad Alimuddin, Eng., Dr. Muhammad Taufiq Rafi		Dr. Muhammad Alimuddin, Eng.		Dr. Muhammad Alimuddin, Eng.
Learning Outcomes Course	SLOs that are imposed on the course					
	SLO-5:	Menguasai konsep Geofisika dan prinsip dalam mengaplikasikan matematika terapan dalam bidang Geofisika				
	SLO-11:	Mampu menerapkan prinsip-prinsip matematika dan sains kebumian, serta prinsip Eksplorasi dan Mitigasi untuk menyelesaikan masalah eksplorasi SDA dan mitigasi bencana (Exploration natural resource and natural disaster mitigation)				
	SLO ⇒ Course Learning Outcomes					
	After completing this course, it is expected:					
	SLO-5	CLO-1: Able to apply the use of special functions in ordinary differential equations (ODE)				
	SLO-11	CLO-2: Able to solve transformation method problems in geophysical problems				
		CLO-3: Able to demonstrate partial differential equations (PDE) in geophysical problems				
	CLO ⇒ Sub-CLO					
	CLO-1	Sub-CLO-1:Able to solve conceptual and application problems of 1st order and higher order ODEs in geophysical mathematical equations				
		Sub-CLO-2:Able to apply concepts and applications of special functions in ODE				
		Sub-CLO-3:Able to solve conceptual and application problems of Boundary Value Problems in mathematical geophysical models				
	CLO-2	Sub-CLO-4:Able to demonstrate comprehensive use of ODE in mathematical geophysics cases				
		Sub-CLO-5:Able to demonstrate the concept and application of the Laplace transform and inverse Laplace transform in mathematical geophysical models				
		Sub-CLO-6:Demonstrate the concept and application of Z-transform and Z-transform inversion in mathematical geophysical models				
		Sub-CLO-7:Demonstrate the concept and application of Fourier series in wave models in geophysics				
		Sub-CLO-8:Demonstrate the concept and application of Continuous-Time Fourier Transform in wave models in geophysics				
		Sub-CLO-9:Demonstrate the concept and application of the Discrete Fourier Transform in wave models in geophysics				
		Sub-CLO-10:Demonstrate the application of Fast Fourier Transform (FFT) to wave models in geophysics				
	CLO-3	Sub-CLO-11:Demonstrating the problem of transformation methods in the case of mathematical geophysics				
		Sub-CLO-12:Demonstrate the concept and application of Linear PDE (parabolic, hyperbolic, elliptic) in mathematical geophysical models				
		Sub-CLO-13:Applying the concepts and applications of Laplace and Fourier transforms in PDE				
		Sub-CLO-14:Demonstrate the use of PDE in a mathematical geophysics case study				
	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-5		CLO-1	SUB-CLO-1	Participation	2	2			
SLO-5		CLO-1	SUB-CLO-2	Participation	2	2			
SLO-5		CLO-1	SUB-CLO-3	Participation	2	2			
SLO-11		CLO-2	SUB-CLO-4	Presentations and Reports	17	17			
SLO-11		CLO-2	SUB-CLO-5	Participation	2	2			
SLO-11		CLO-2	SUB-CLO-6	Participation	2	2			
SLO-11		CLO-2	SUB-CLO-7	Participation	2	2			
SLO-11		CLO-2	SUB-CLO-8	Participation and Written Test	12	12			
SLO-11		CLO-2	SUB-CLO-9	Participation and Written Test	12	12			
SLO-11		CLO-2	SUB-CLO-10	Participation and Written Test	8	8			
SLO-11		CLO-3	SUB-CLO-11	Reports and Presentations	18	18			
SLO-11		CLO-3	SUB-CLO-12	Participation	2	2			
SLO-11		CLO-3	SUB-CLO-13	Participation	2	2			
SLO-11		CLO-3	SUB-CLO-14	Presentations and Reports	17	17			
					100	100			
Course Description		The Mathematical Geophysics II course discusses the concept and application of ordinary differential equations (ODE), transformation methods and partial differential equations (PDE) in geophysical cases with a load of 3 credits. This course is the core of all geophysical methods and models which are represented in the form of maps, graphs, cross sections or contours. Presented for third semester students in the Geophysics Undergraduate Study Program. The person in charge of the course is the manager of the Mathematical Geophysics II course. Learning methods are Small Group Discussion and Case-Based Study							
Learning Materials/Subjects		1. Ordinary Differential Equation (ODE) 2. Transformation Laplace 3. Transformation Z 4. Fourier Series and Transformations Fourier 5. Partial Differential Equation (PDE) linear (parabolic, hyperbolic, elliptic)							
Reference		Main References							
		Yang, W.Y., Choi, Y.K., Kim, J., Kim, M.C., Kim, H.J., and Im, T. 2018. Engineering Mathematics with Matlab. Chapman and Hall/CRC							
		Additional References							
		Kreyszig, E., Stroud, K., and Stephenson, G. 2008. Advanced engineering mathematics. Integration, 9(4). Strang, G. 2016. Introduction to linear algebra Fifth Edition. Wellesley, MA: Wellesley-Cambridge Press.							
Teaching Team		Dr. Muhammad Alimuddin, Eng., Dr. Muhammad Taufiq Rafi							
Course requirement		Mathematical Geophysics I							
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 solve conceptual and application problems of 1st order and higher order ODEs in geophysical mathematical equations (CPMK-1)	Formative: Skilled in the application of linear and nonlinear systems for 1st order ODEs and higher order Cauchy-Euler equations Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (2) dinilai dengan rubrik 1 Assessment Technique: Non Test	Studying: Case Study (Case Study) 1 x 3 x 50" Other Forms: Self-Directed Learning - Reading First-Order Differential Material Equations and Higher-Order Differential Equations in Sikola in Week 1 Learning Flow - Practice doing the exercises in First-Order Differential Equations and Higher-Order Differential Equations 1 x 3 x 60"		- Contract Lectures - Eye study materials college - First-Order Differential Equations - Higher-Order Differential Equations	2
2	Able to apply concepts and applications of special functions in ODE (CPMK-1)	Formative: Skilled in applying Bessel, Gamma, and Legendre functions in solving analytical solutions of 2nd order ODEs Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (2) dinilai dengan rubrik 1 Assessment Technique: Non Test	Studying: Case Study (Case Study) 1 x 3 x 50" Other Forms: Self-Directed Learning - Reading Special Second-Order Linear Material ODEs in Sikola in Week 2 Learning Flow - Practice doing the exercises in Special Second-Order Linear ODEs 1 x 3 x 60"		- Bessel's Equation - Legendre's Equations	2

3	Able to solve conceptual and application problems of Boundary Value Problems in mathematical geophysical models (CPMK-1)	Formative: Skilled in analyzing Boundary Conditions for Linear Differential Equation Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (2) dinilai dengan rubrik 1 Assessment Technique: Non Test	Studying: Case Study (Case Study) 1 x 3 x 50" Other Forms: Self-Directed Learning - Reading Boundary Value Problems material in Sikola in Week 3 Learning Flow - Practice doing the exercises in Boundary Value Problems 1 x 3 x 60"		Boundary Value Problems	2
4	Able to demonstrate comprehensive use of ODE in mathematical geophysics cases (CPMK-2)	Formative: Skilled in demonstrating analytical and numerical solutions of 1st order and higher order ODEs, special functions for ODEs and Boundary Value Problems and presenting them in graph or contour form Sumative: -	Formative Criteria: Presentation dinilai dengan rubrik 3 Report dinilai dengan rubrik 2 Sumative Criteria: Project/Case Study (7) dinilai dengan rubrik 3 Project/Case Study (10) dinilai dengan rubrik 2 Assessment Technique: Test	Seminar: Group discussion (Small Group Discussion) 1 x 3 x 100" Other Forms: Self-Directed Learning Revise input on presentations and reports 1 x 3 x 60"		- First-Order Differential Equations - Higher-Order Differential Equations - Bessel's Equation - Legendre's Equation - Boundary Value Problems	17

5	Able to demonstrate the concept and application of the Laplace transform and inverse Laplace transform in mathematical geophysical models (CPMK-2)	Formative: Skilled in using the Laplace transform and inverse Laplace transform in ODEs that arise from geophysical problems Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (2) dinilai dengan rubrik 1 Assessment Technique: Non Test	Studying: Case Study (Case Study) 1 x 3 x 50" Other Forms: Self-Directed Learning • Reading material on Laplace transforms and inverse transforms Laplace in Week 5 Learning Flow • Practice doing exercises in the Laplace transform and the inverse Laplace transform 1 x 3 x 60" Other Forms: Case Study (Case Study) Work in groups on the case study given regarding the Laplace transform and inversion of the Laplace transform 1 x 3 x 60"		• Transformation Laplace • Inversion transformation Laplace	2
6	Demonstrate the concept and application of Z-transform and Z-transform inversion in mathematical geophysical models (CPMK-2)	Formative: Skilled in applying the use of Z-transform and its inversion in the case of Discrete-Time and Continuous-Time signals Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (2) dinilai dengan rubrik 1 Assessment Technique: Non Test	Studying: Group discussion (Small Group Discussion) 1 x 3 x 50" Other Forms: Self-Directed Learning 1 x 3 x 60"		• Transformation Z • Inversion transformation Z	2

7	Demonstrate the concept and application of Fourier series in wave models in geophysics (CPMK-2)	Formative: Skilled in reconstruction of signal types in geophysics using Fourier series Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (2) dinilai dengan rubrik 1 Assessment Technique: Non Test	Studying: Case Study (Case Study) 1 x 3 x 50" Other Forms: Self-Directed Learning - Reading Fourier series material in Sikola in Week 7 Learning Flow - Practice doing the exercises in the series Fourier 1 x 3 x 60" Other Forms: Case Study (Case Study) Work in groups on the case study given regarding Fourier series 1 x 3 x 60"		Continuous-Time Fourier Series (CTFS)	2
8	Demonstrate the concept and application of Continuous-Time Fourier Transform in wave models in geophysics (CPMK-2)	Formative: Skilled in the use of Continuous-Time Fourier Transform to analyze geophysical signals Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Written Test dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (2) dinilai dengan rubrik 1 Project/Case Study (10) dinilai dengan rubrik 1 Assessment Technique: Test and Non-Test	Studying: Case Study (Case Study) 1 x 3 x 50" Other Forms: Self-Directed Learning - Reading Continuous-Time Fourier Transform material at Sikola in Week 8 Learning Flow - Practice doing the exercises in Continuous-Time Fourier Transform 1 x 3 x 60" Other Forms: Case Study (Case Study) Work in groups on the case study given regarding Continuous-Time Fourier Transform 1 x 3 x 60"		Continuous-Time Fourier Transform (CTFT)	12

9	Demonstrate the concept and application of the Discrete Fourier Transform in wave models in geophysics (CPMK-2)	Formative: Skilled in the application of Discrete Fourier Transform in analyzing signals in Geophysics Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Written Test dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (2) dinilai dengan rubrik 1 Project/Case Study (10) dinilai dengan rubrik 1 Assessment Technique: Test and Non-Test	Studying: Case Study (Case Study) 1 x 3 x 50" Other Forms: Self-Directed Learning - Reading Discrete Fourier Transform material in Sikola in Week 9 Learning Flow - Practice doing the exercises in Discrete Fourier Transform 1 x 3 x 60" Other Forms: Case Study (Case Study) Work in groups on the case study given regarding the Discrete Fourier Transform 1 x 3 x 60"		Discrete Fourier Transform	12
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10	Demonstrate the application of Fast Fourier Transform (FFT) to wave models in geophysics (CPMK-2)	Formative: Skilled in Decimation-in-Time (DIT) and Decimation-in-Frequency (DIF) applications for digital signals in geophysics Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Written Test dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (2) dinilai dengan rubrik 1 Project/Case Study (6) dinilai dengan rubrik 1 Assessment Technique: Test and Non-Test	Studying: Case Study (Case Study) 1 x 3 x 50" Other Forms: Self-Directed Learning - Reading Fast Fourier Transform material at Sikola in Week 10 Learning Flow - Practice doing exercises in Fast Fourier Transform 1 x 3 x 60" Other Forms: Case Study (Case Study) Work in groups on the case study given regarding the Fast Fourier Transform 1 x 3 x 60"		Fast Fourier Transform (FFT)	8
11	Demonstrating the problem of transformation methods in the case of mathematical geophysics (CPMK-3)	Formative: Skilled in the application of transformation methods (Laplace, Z and Fourier) to signal cases in geophysics Sumative: -	Formative Criteria: Report dinilai dengan rubrik 2 Presentation dinilai dengan rubrik 3 Sumative Criteria: Project/Case Study (10) dinilai dengan rubrik 2 Project/Case Study (8) dinilai dengan rubrik 3 Assessment Technique: Test	Seminar: Group discussion (Small Group Discussion) 1 x 3 x 100" Other Forms: Self-Directed Learning Revise input on presentations and reports 1 x 3 x 60"		- Laplace transform and inverse transform Laplace - Z transformation and inversion of transformation Z - Fourier series and transformations Fourier	18

12-13	Demonstrate the concept and application of Linear PDE (parabolic, hyperbolic, elliptic) in mathematical geophysical models (CPMK-3)	Formative: Skilled in applying the variable separation method for the case of the heat equation, Laplace equation and wave equation Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (2) dinilai dengan rubrik 1 Assessment Technique: Non Test	Studying: Case Study (Case Study) 2 x 3 x 50" Other Forms: Self-Directed Learning - Reading PDE material at Sikola on Learning Flow for Weeks 12 to 13 - Practice doing the exercises in PDE 2 x 3 x 60" Other Forms: Case Study (Case Study) Work in groups on case studies given regarding PDE 2 x 3 x 60"		- Elliptic PDE - Parabolic PDE - Hyperbolic PDE - PDEs in other Coordinate Systems	2
14-15	Applying the concepts and applications of Laplace and Fourier transforms in PDE (CPMK-3)	Formative: Skilled in applying Laplace and Fourier transform methods for the case of the heat equation, Laplace equation and wave equation Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (2) dinilai dengan rubrik 1 Assessment Technique: Non Test	Studying: Case Study (Case Study) 1 x 3 x 50" Other Forms: Self-Directed Learning - Reading PDE material at Sikola on Learning Flow Weeks 14 to 15 - Practice doing the exercises in PDE 2 x 3 x 60" Other Forms: Case Study (Case Study) Work in groups on case studies given regarding PDE 2 x 3 x 60"		Laplace/Fourier transform for solving PDEs	2

16	Demonstrate the use of PDE in a mathematical geophysics case study (CPMK-3)	Formative: Skilled in solving PDEs using variable separation methods and transformation techniques (Laplace and Fourier) Sumative: -	Formative Criteria: Presentation dinilai dengan rubrik 3 Report dinilai dengan rubrik 2 Sumative Criteria: Project/Case Study (10) dinilai dengan rubrik 2 Project/Case Study (7) dinilai dengan rubrik 3 Assessment Technique: Test		-	17
						100

Matrix of SLO, CLO, and Assessment Method

SLO / CLO	CLO-1	CLO-2	CLO-3
CPL-5 (P2)	Project/Case Study (Weight 2%) Project/Case Study (Weight 2%) Project/Case Study (Weight 2%)		
CPL-11 (KK1)		Project/Case Study (Weight 17%) Project/Case Study (Weight 2%) Project/Case Study (Weight 2%) Project/Case Study (Weight 2%) Project/Case Study (Weight 12%) Project/Case Study (Weight 12%) Project/Case Study (Weight 8%)	Project/Case Study (Weight 18%) Project/Case Study (Weight 2%) Project/Case Study (Weight 2%) Project/Case Study (Weight 17%)

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-5	CLO-1	SUB-CLO-1	Participation	2	2		
SLO-5	CLO-1	SUB-CLO-2	Participation	2	2		
SLO-5	CLO-1	SUB-CLO-3	Participation	2	2		
SLO-11	CLO-2	SUB-CLO-4	Presentations and Reports	17	17		
SLO-11	CLO-2	SUB-CLO-5	Participation	2	2		
SLO-11	CLO-2	SUB-CLO-6	Participation	2	2		
SLO-11	CLO-2	SUB-CLO-7	Participation	2	2		
SLO-11	CLO-2	SUB-CLO-8	Participation and Written Test	12	12		
SLO-11	CLO-2	SUB-CLO-9	Participation and Written Test	12	12		
SLO-11	CLO-2	SUB-CLO-10	Participation and Written Test	8	8		
SLO-11	CLO-3	SUB-CLO-11	Reports and Presentations	18	18		
SLO-11	CLO-3	SUB-CLO-12	Participation	2	2		
SLO-11	CLO-3	SUB-CLO-13	Participation	2	2		
SLO-11	CLO-3	SUB-CLO-14	Presentations and Reports	17	17		
				100	100		

Lampiran Rubrik 1 | Rubrik Holistik

Tabel 6. 1 Rubrik Holistik		
Grade Capaian	Skor	Uraian
Sangat Baik	≥ 85	Memperlihatkan pemahaman yang lengkap tentang permasalahan. Semua metode dan persyaratan tentang tugas terdapat dalam jawaban
Baik	71 - 84	Memperlihatkan cukup pemahaman tentang permasalahan. Semua persyaratan tentang tugas terdapat dalam jawaban
Cukup Baik	61 - 70	Memperlihatkan hanya sebagian pemahaman tentang permasalahan. Kebanyakan persyaratan tentang tugas terdapat dalam jawaban
Kurang	51 - 60	Memperlihatkan sedikit pemahaman tentang permasalahan. Banyak persyaratan tugas yang tidak ada
Sangat kurang	< 51	Memperlihatkan tidak ada pemahaman tentang permasalahan

Lampiran Rubrik 2 | Rubrik analitik makalah (kelompok atau individu)

Kriteria/Dimensi	Penilaian mahasiswa					Nilai masing masing kriteria
	Sangat baik	Baik	Cukup	Kurang	Sangat kurang	
	Skor ≥ 85	Skor 71 - 84	Skor 61 - 70	Skor 51 – 60	Skor 41 - 50	
Sistematika Laporan – SL	laporan dibuat sesuai sistematika penulisan yang dijelaskan di detail tugas	laporan dibuat dengan benar tetapi kurang jelas	laporan dibuat cukup benar dan kurang jelas	laporan dibuat kurang benar dan kurang jelas	laporan dibuat dengan sistematika yang tidak sesuai yang diminta	10 %
Kelengkapan Laporan – KL	laporan dibuat secara lengkap sesuai petunjuk pembuatan laporan	laporan dibuat tanpa referensi dalam laporan	laporan dibuat tanpa referensi dalam laporan dan kesimpulan	laporan dibuat tanpa referensi dalam laporan, kesimpulan dan daftar pustaka	laporan dibuat tanpa referensi dalam laporan, kesimpulan, daftar pustaka dan lampiran yang diperlukan	20 %
Kejelasan dan keruntutan penulisan –JR	laporan jelas, dapat dipahami, ditulis secara runtut	laporan jelas, tetapi penulisan kurang runtut	laporan cukup jelas, cukup sesuai dengan keruntutan penulisan, tapi ada beberapa ketidak teraturan	laporan kurang jelas, kurang sesuai dengan keruntutan penulisan	laporan tidak jelas, tidak sesuai dengan keruntutan penulisan	20 %
Validitas Referensi – VR	Mencantumkan referensi yang valid di setiap paragraf, rumus, tabel dan gambar	Mencantumkan referensi yang valid tapi di beberapa paragraf, rumus, tabel dan gambar	Ada beberapa referensi yang kurang valid, walau lengkap tercantum di semua paragraf, rumus, tabel dan gambar	Lebih banyak referensi yang kurang valid, kurang tercantum di paragraf, rumus, tabel dan gambar	Tidak menggunakan referensi yang valid dan dominan tidak dicantumkan di setiap paragraf tabel, rumus dan gambar	20%
Kebenaran konsep ide yang dipaparkan – KI	konsep/ide yang dipaparkan tepat, benar, dan sesuai dengan teori	konsep/ide yang dipaparkan sesuai dengan teori tetapi kurang jelas	konsep/ide yang dipaparkan cukup	konsep/ide yang dipaparkan kurang tepat	konsep/ide yang dipaparkan tidak tepat	30 %

Lampiran Rubrik 3 | Rubrik Presentasi

Kriteria/Dimensi	Penilaian mahasiswa					Nilai masing masing kriteria
	Sangat Baik	Baik	Cukup	Kurang	Sangat kurang	
	Skor > 85	Skor 71 - 84	Skor 61 - 70	Skor 51 – 60	Skor 41 - 50	

Kriteria/ Dimensi	Penilaian mahasiswa					Nilai masing masing kriteria
	Sangat Baik	Baik	Cukup	Kurang	Sangat kurang	
	Skor > 85	Skor 71 - 84	Skor 61 - 70	Skor 51 – 60	Skor 41 - 50	
Penguasaan Materi –PM	Isi mampu menggugah pendengar untuk mengembangkan pikiran.	Isi akurat dan lengkap. Para pendengar menambah wawasan baru tentang topik tersebut.	Isi secara umum akurat, tetapi tidak lengkap. Para pendengar bisa mempelajari beberapa fakta yang tersirat, tetapi mereka tidak menambah wawasan baru tentang topik tersebut.	Isinya kurang akurat, karena tidak ada data faktual, tidak menambah pemahaman pendengar	Isinya tidak akurat atau terlalu umum. Pendengar tidak belajar apapun atau kadang menyenatkan.	20%
Sistematika – SI	terorganisasi dengan menyajikan fakta yang didukung oleh contoh yang telah dianalisis sesuai konsep	terorganisasi dengan baik dan menyajikan fakta yang meyakinkan untuk mendukung kesimpulan.	Presentasi mempunyai fokus dan menyajikan beberapa bukti yang mendukung kesimpulan.	Cukup fokus, namun bukti kurang mencukupi untuk digunakan dalam menarik kesimpulan	Tidak ada organisasi yang jelas. Fakta tidak digunakan untuk mendukung pernyataan.	10 %
Suara & Ekspresi _SE	Siswa menggunakan suara yang jelas dan volume yang sesuai, pengucapan istilah tepat. Semua penonton bisa mendengar presentasi.	Suara siswa jelas. Kadang terlalu cepat/lambat. Siswa mengucapkan istilah-istilah yang ada dengan benar. Kebanyakan penonton bisa mendengar presentasi.	Suara siswa cukup jelas, tapi ada beberapa yang kurang jelas. Sering cepat/lambat. Siswa mengucapkan istilah-istilah yang ada kadang kurang tepat. Kebanyakan penonton bisa mendengar presentasi.	Suara siswa pelan, kadang salah mengucapkan istilah. Penonton masih mengalami kesulitan mendengar presentasi.	Siswa bicara seperti bergumam, sering salah mengucapkan istilah, dan suaranya terlalu pelan sehingga penonton yang duduk di belakang tidak dapat mendengar dengan jelas.	10 %
Kepercayaan Diri – KD	Berbicara dengan semangat, menularkan semangat dan antusiasme pada pendengar	Pembicara tenang dan menggunakan intonasi yang tepat, berbicara tanpa bergantung pada catatan, dan berinteraksi secara intensif dengan pendengar. Pembicara selalu kontak mata dengan pendengar.	Secara umum pembicara tenang, tetapi dengan nada yang datar dan cukup sering bergantung pada catatan. Kadangkadang kontak mata dengan pendengar diabaikan.	Berpatokan pada catatan, tidak ada ide yang dikembangkan di luar catatan, suara monoton	Pembicara cemas dan tidak nyaman, dan membaca berbagaicatatan daripada berbicara. Pendengar sering diabaikan. Tidak terjadi kontak mata karena pembicara lebih banyak melihat ke papan tulis atau layar.	20 %
Efektifitas alat bantu presentasi – EF	menggunakan alat bantu visual untuk menjelaskan dengan tepat dan memperkuat presentasi	Alat bantu visual siswa mendukung presentasi.	Siswa menggunakan alat bantu visual tapi kurang tepat karena isi yang kurang sistematis atau kurang sesuai kaidah presentasi	Siswa menggunakan alat bantu visual namun kurang mendukung presentasi.	Siswa tidak menggunakan alat peraga ATAU menggunakan alat peraga secara berlebihan dan tidak tepat.	10 %
Kerjasama – KE	Kerjasama grup terlihat solid. Presentasi dilatih dan dipersiapkan dengan baik. Ada pembagian porsi yang jelas dengan pembagian waktu yang baik.	Cukup solid. Presentasi dilatih dengan baik. Ada pembagian porsi yang jelas meski kadang tumpang tindih dengan bagian anggota lain. Manajemen waktu cukup baik.	Cukup solid. Presentasi kurang dilatih, pembagian porsi ada yang tidak seimbang. Manajemen waktu ada yang dominan memakai waktu, sehingga yang berikutnya tergesa gesa.	Kurang solid. Presentasi kurang dilatih. Ada pembagian porsi presentasi namun masih disertai sedikit miskomunikasi dengan anggota grup. Manajemen waktu kurang diperhatikan.	Tidak solid. Persiapan presentasi kurang. Tidak ada pembagian porsi presentasi yang jelas. Beberapa miskomunikasi dengan anggota grup. Manajemen waktu sangat buruk.	10 %

Kriteria/ Dimensi	Penilaian mahasiswa					Nilai masing masing kriteria
	Sangat Baik	Baik	Cukup	Kurang	Sangat kurang	
	Skor > 85	Skor 71 - 84	Skor 61 - 70	Skor 51 – 60	Skor 41 - 50	
Tanya jawab - TJ (Keaktifan)	Siswa menunjukkan pemahaman mendalam (lebih dari yang dibutuhkan) dengan menjawab semua pertanyaan yang diajukan	Siswa dengan percaya diri menguasai materi dan menjawab banyak pertanyaan dengan disertai beberapa penjelasan yang mendukung.	Siswa kurang yakin dengan informasi yang dipresentasikan dan kurang mampu menjawab pertanyaan dengan tepat.	Siswa tidak yakin dengan informasi yang dipresentasikan dan hanya mampu menjawab pertanyaan dasar saja tanpa mampu menjelaskan lebih lanjut.	Siswa tidak memiliki pemahaman informasi, siswa tidak bisa menjawab pertanyaan tentang topik yang dipresentasikan.	20 %