SEMESTER LEARNING PLAN

PARTIAL DIFFERENTIAL EQUATIONS COURSES
(23H01121003)

TEACHING TEAM

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

2025

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

Vision

The scientific vision is to become a study program with an international reputation in the development of mathematics based on the Indonesian maritime continent by 2030

Vision Strategy

Misson

To fulfill the above vision, the Undergraduate Mathematics Study Program has four missions, namely:

- Organizing innovative and effective mathematics learning to improve the quality and creativity of students in order to compete nationally and internationally.
- Improving a research culture that produces internationally reputable publications.
- Playing an active role in community service activities and collaborating with other academic institutions, government, business, media and society.
- Carry out governance in the Mathematics Study Program that is effective, efficient and transparent based on IT and ISO 9001:2015 standards to achieve the tridharma goals.

Graduate Profiles

Gagal diterjemahkan

PLO charged to courses

CPL-1 (ILO 1) - Students are able to demonstrate an advanced understanding of basic pure and simple applied mathematics.

CPL-2 (P2) - The students are able to identify objects, techniques, and theorems in fundamental mathematics, and making a connection for solving problems

CPL-3 (KU1) - The students are able to analyse a mathematical problem with logic, analytic, and systematic structure

CPL-4 (KU2) - The students are able to use their sufficiently mathematical critical thinking for abstraction and generalization of a mathematical problem

CPL-5 (KK1) - The students are able to construct mathematical modelling with relatively new ideas and present the results orally and in writing

CPL-6 (KK2) - The students are able to apply the mathematical method for solving a mathematical related-problem with or without the aid of computers and software

Course Learning Outcomes (CLO)

CPMK-1: Students are able to demonstrate their understanding of periodic functions and their approaches (CPL1 dan CPL2)

CPMK-2: Students are able to demonstrate their understanding in classifying and solving partial differential equations (CPL1 dan CPL2)

CPMK-3: Students are able to use concepts effectively to solve partial differential equation problems in mathematics, science and engineering (CPL3, CPL4, CPL5 dan CPL6)

CPMK-4: Students are able to demonstrate their understanding of concepts through the use of technology when necessary (CPL2, CPL3, CPL4 dan CPL5)

CPMK-5: Students are able to identify techniques and methods in solving partial differential equations (CPL2, CPL3 dan CPL4)

CPMK-6: Students are able to communicate mathematical ideas in an appropriate context both orally and in writing with the group (CPL5 dan CPL6)

Sub-CLO

Sub CPMK-1: Able to classify PDP, able to get a general solution, able to get a Fourier series approach forpiecewise continuous function (CPMK-1, CPMK-2 dan CPMK-3)

Sub CPMK-2: Able to get a Fourier series approach forvarious periodic functions and recognize the orthogonality properties of Fourier series. Regarding the PDP trichotomy (CPMK-1, CPMK-2 dan CPMK-3)

Sub CPMK-3: Get to know various kinds of initial value problems, problemslimit values, as well as variable separation methods forsolve the one-dimensional heat equation withzero or constant limits. Capable of transformationPDP to its standard form (CPMK-1, CPMK-2 dan CPMK-4)

Sub CPMK-4: Able to solve one-dimensional heat equationswith Laplace transform, Fourier transform and methodsother (CPMK-1, CPMK-2 dan CPMK-4)

Sub CPMK-5: Able to solve wave equation onedimensions. Was able to obtain D'Alembert's solution forone-dimensional wave equation (CPMK-1, CPMK-2, CPMK-5 dan CPMK-6)

Sub CPMK-6: Able to solve the two-dimensional Laplace equationin Cartesian coordinates. Able to completetwo-dimensional Laplace equation in polar coordinates. Obtaining the Poisson solution for the annulus problem of the two-dimensional Laplace equation (CPMK-1, CPMK-2 dan CPMK-6)

Sub CPMK-7: Able to solve two-dimensional heat equations,able to solve two-dimensional wave equations (CPMK-1, CPMK-2, CPMK-3 dan CPMK-4)

Sub CPMK-8: Get to know numerical methods for solving equationsparcel differential (CPMK-1, CPMK-4 dan CPMK-5)

Learning Analytics

Partial Differential Equations

↑

Get to know numerical methods for solving equationsparcel differential (CPMK-1, CPMK-4 dan CPMK-5)

↑

Able to solve two-dimensional heat equations,able to solve two-dimensional wave equations (CPMK-1, CPMK-2, CPMK-3 dan CPMK-4)

↑

Able to solve the two-dimensional Laplace equationin Cartesian coordinates. Able to completetwo-dimensional Laplace equation in polar coordinates. Obtaining the Poisson solution for the annulus problem of the two-dimensional Laplace equation (CPMK-1, CPMK-2 dan CPMK-6)

↑

Able to solve wave equation onedimensions. Was able to obtain D'Alembert's solution forone-dimensional wave equation (CPMK-1, CPMK-2, CPMK-5 dan CPMK-6)

↑

Able to solve one-dimensional heat equationswith Laplace transform, Fourier transform and methodsother (CPMK-1, CPMK-2 dan CPMK-4)

↑

Get to know various kinds of initial value problems, problemslimit values, as well as variable separation methods forsolve the one-dimensional heat equation withzero or constant limits. Capable of transformationPDP to its standard form (CPMK-1, CPMK-2 dan CPMK-4)

↑

Able to get a Fourier series approach forvarious periodic functions and recognize the orthogonality properties of Fourier series. Regarding the PDP trichotomy (CPMK-1, CPMK-2 dan CPMK-3)

↑

Able to classify PDP, able to get a general solution, able to get a Fourier series approach forpiecewise continuous function (CPMK-1, CPMK-2 dan CPMK-3)

Have passed the course Advanced Mathematics and Differential Equations

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

Course	Code	Cource Group	Credits	SEMESTER	Compilation Date
Partial Differential Equations	23H01121003	Applied Mathematics	3	4	10 Agustus 2024

AUTHORITY	SLP Developer Lecturer	Coordinator	Head of Study Program
	Prof. Dr. Jeffry Kusuma, Prof. Agustinus Ribal, S.Si.,M.Sc., Ph. D, Naimah Aris, S.Si.,M.Math.	Prof. Dr. Jeffry Kusuma	Dr. Firman, S.Si.,M.Si.

SLOs that are imposed on the course	
SLO-1:	Mahasiswa memiliki pemahaman yang relatif mendalam dalam matematika murni dan matematika terapan sederhana.
SLO-2:	Mahasiswa mampu mengidentifikasi objek, teknik, dan sifat dalam matematika dasar, dan membuat koneksi untuk menyelesaikan masalah
SLO-3:	Mahasiswa mampu menganalisis suatu masalah matematika dengan logika, analitik, dan struktur sistematis
SLO-4:	Mahasiswa dapat menggunakan pemikiran kritis matematis mereka yang cukup untuk abstraksi dan generalisasi masalah matematika berdasarkan hasil analisis informasi dan data
SLO-5:	Mahasiswa dapat membangun pemodelan matematika dengan ideide yang relatif baru dan mempresentasikan hasil dengan jelas secara lisan dan tertulis
SLO-6:	Mahasiswa dapat menerapkan metode matematika untuk memecahkan masalah terkait matematika dengan atau tanpa bantuan komputer dan perangkat lunak

SLO ⇒ Course Learning Outcomes	
After completing this course, it is expected:	
SLO-1	**CLO-1:** Students are able to demonstrate their understanding of periodic functions and their approaches
	CLO-2: Students are able to demonstrate their understanding in classifying and solving partial differential equations
SLO-2	**CLO-1:** Students are able to demonstrate their understanding of periodic functions and their approaches
	CLO-2: Students are able to demonstrate their understanding in classifying and solving partial differential equations
	CLO-4: Students are able to demonstrate their understanding of concepts through the use of technology when necessary
	CLO-5: Students are able to identify techniques and methods in solving partial differential equations
SLO-4	**CLO-3:** Students are able to use concepts effectively to solve partial differential equation problems in mathematics, science and engineering
	CLO-4: Students are able to demonstrate their understanding of concepts through the use of technology when necessary

Learning Outcomes Course		**CLO-5:** Students are able to identify techniques and methods in solving partial differential equations
	SLO-3	**CLO-3:** Students are able to use concepts effectively to solve partial differential equation problems in mathematics, science and engineering
		CLO-4: Students are able to demonstrate their understanding of concepts through the use of technology when necessary
		CLO-5: Students are able to identify techniques and methods in solving partial differential equations
	SLO-5	**CLO-3:** Students are able to use concepts effectively to solve partial differential equation problems in mathematics, science and engineering
		CLO-4: Students are able to demonstrate their understanding of concepts through the use of technology when necessary
		CLO-6: Students are able to communicate mathematical ideas in an appropriate context both orally and in writing with the group
	SLO-6	**CLO-3:** Students are able to use concepts effectively to solve partial differential equation problems in mathematics, science and engineering
		CLO-6: Students are able to communicate mathematical ideas in an appropriate context both orally and in writing with the group
	CLO ⇒ Sub-CLO	
	CLO-1	**Sub-CLO-1:**Able to classify PDP, able to get a general solution, able to get a Fourier series approach forpiecewise continuous function
		Sub-CLO-2: Able to get a Fourier series approach forvarious periodic functions and recognize the orthogonality properties of Fourier series. Regarding the PDP trichotomy
		Sub-CLO-3: Get to know various kinds of initial value problems, problemslimit values, as well as variable separation methods forsolve the one-dimensional heat equation withzero or constant limits. Capable of transformationPDP to its standard form
		Sub-CLO-4: Able to solve one-dimensional heat equationswith Laplace transform, Fourier transform and methodsother
		Sub-CLO-5: Able to solve wave equation onedimensions. Was able to obtain D'Alembert's solution forone-dimensional wave equation
		Sub-CLO-6: Able to solve the two-dimensional Laplace equationin Cartesian coordinates. Able to completetwo-dimensional Laplace equation in polar coordinates. Obtaining the Poisson solution for the annulus problem of the two-dimensional Laplace equation
		Sub-CLO-7: Able to solve two-dimensional heat equations,able to solve two-dimensional wave equations
		Sub-CLO-8: Get to know numerical methods for solving equationsparcel differential
	CLO-2	**Sub-CLO-1:**Able to classify PDP, able to get a general solution, able to get a Fourier series approach forpiecewise continuous function
		Sub-CLO-2: Able to get a Fourier series approach forvarious periodic functions and recognize the orthogonality properties of Fourier series. Regarding the PDP trichotomy
		Sub-CLO-3: Get to know various kinds of initial value problems, problemslimit values, as well as variable separation methods forsolve the one-dimensional heat equation withzero or constant limits. Capable of transformationPDP to its standard form
		Sub-CLO-4: Able to solve one-dimensional heat equationswith Laplace transform, Fourier transform and methodsother
		Sub-CLO-5: Able to solve wave equation onedimensions. Was able to obtain D'Alembert's solution forone-dimensional wave equation
		Sub-CLO-6: Able to solve the two-dimensional Laplace equationin Cartesian coordinates. Able to completetwo-dimensional Laplace equation in polar coordinates. Obtaining the Poisson solution for the annulus problem of the two-dimensional Laplace equation

	Sub-CLO-7: Able to solve two-dimensional heat equations,able to solve two-dimensional wave equations
CLO-3	**Sub-CLO-1:**Able to classify PDP, able to get a general solution, able to get a Fourier series approach forpiecewise continuous function
	Sub-CLO-2: Able to get a Fourier series approach forvarious periodic functions and recognize the orthogonality properties of Fourier series. Regarding the PDP trichotomy
	Sub-CLO-7: Able to solve two-dimensional heat equations,able to solve two-dimensional wave equations
CLO-4	**Sub-CLO-3:**Get to know various kinds of initial value problems, problemslimit values, as well as variable separation methods forsolve the one-dimensional heat equation withzero or constant limits. Capable of transformationPDP to its standard form
	Sub-CLO-4: Able to solve one-dimensional heat equationswith Laplace transform, Fourier transform and methodsother
	Sub-CLO-7: Able to solve two-dimensional heat equations,able to solve two-dimensional wave equations
	Sub-CLO-8: Get to know numerical methods for solving equationsparcel differential
CLO-5	**Sub-CLO-5:**Able to solve wave equation onedimensions. Was able to obtain D'Alembert's solution forone-dimensional wave equation
	Sub-CLO-8: Get to know numerical methods for solving equationsparcel differential
CLO-6	**Sub-CLO-5:**Able to solve wave equation onedimensions. Was able to obtain D'Alembert's solution forone-dimensional wave equation
	Sub-CLO-6: Able to solve the two-dimensional Laplace equationin Cartesian coordinates. Able to completetwo-dimensional Laplace equation in polar coordinates. Obtaining the Poisson solution for the annulus problem of the two-dimensional Laplace equation

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					
				Independent Assignment	Case Studies	Written Exam			
SLO-6	CLO-3	SUB-CLO-1	Accurate understanding and concise answers.	5	0	0	5		
SLO-6	CLO-3	SUB-CLO-2		0	10	0	10		
SLO-5	CLO-4	SUB-CLO-3		0	10	0	10		
SLO-5	CLO-4	SUB-CLO-4		0	20	0	20		
SLO-6	CLO-6	SUB-CLO-5		0	10	5.71	15.71		
SLO-6	CLO-6	SUB-CLO-6		10	0	5.71	15.71		
SLO-5	CLO-4	SUB-CLO-7		10	0	5.71	15.71		
SLO-4	CLO-5	SUB-CLO-8		5	0	2.86	7.86		
				30	50	20	100		

SLOs that are charged on the Course	CPMK	SUB CPMK	Form of Assessment*				Weight	Value	Student Score
			Formative	Sumative					
				Independent Assignment	Case Studies	Written Exam			

Course Description	This course discusses the classification of partial differential equations, functions periodic, Fourier series, PDP trichotomy, initial value problems, boundary values, variable separation method for the 1D heat equation, transformation of variables to other variables, several other methods for solving the 1D heat equation, transformation to canonical (standard) form, 1D wave equation, D'Alembert solution to the 1D wave equation, 2D Laplace equation in Cartesian coordinates, 2D Laplace equation in polar coordinates, Poisson solution for annulus problems, 2D heat equations, 2D wave equations, as well as numerical methods for solving partial differential equations.
Learning Materials/Subjects	1. Introduction to PDP, Notation and General Solutions PDP (Introduction to partial differential equation/PDE, notation and the general solution of PDE) 2. Classification of PDP (Classification of PDE) 3. Fourier series and periodic function (Fourier series and periodic function) 4. Trichotomy of PDE (Trichotomy of PDE) 5. The problem of initial values & boundary values (Initial and boundary value problems) 6. Methods of separation variables (Methods of separation variables) 7. Reduction to canonical / standard form (Reduction into canonical form) 8. Method of separation variables for 1D heat equations (Method of separation variables for one dimensional heat equation) 9. Other methods for one dimensional heat equation 10. 1D Wave Equation (One dimensional wave equations) 11. D'Alembert solution for one dimensional wave equations 12. Two dimensional Laplace equation (Two dimensional Laplace equations) 13. Laplace equation in polar coordinates 14. Neumann problem for Laplace equation (Neumann Problem for Laplace equation) 15. Poisson solution for the annulus problem (Poisson solution for Laplace equation in the annulus) 16. Two dimensions heat equation (Two dimensions heat equation) 17. Two dimensions wave equation (Two dimensions wave equation) 18. Introduction to numerical solution for PDE (Introduction to numerical solution for PDE)
Reference	**Main References**
	1. Partial Differential Equations, Jeffry Kusuma, Center for Studies and Learning Resources, Hasanuddin University 2018. 2. Partial Differential Equations with Fourier Series and Boundary Value Problems, Asmar, Nakhle, Pearson Prentice Hall. 3. Differential Equations Partial, Jeffry Kusuma, Depublish, 2023
	Additional References
	1. Partial Differential Equations for Scientists and Engineers, Farlow, Stanley J., John Wiley & Sons. 2. Advanced Engineering Mathematics, O'Neil, Peter V., Thomson. 3. Advanced Engineering Mathematics, Kreyszig, Erwin, John Wiley & Sons. 4. Other sources on the Internet.
Teaching Team	Prof. Dr. Jeffry Kusuma, Prof. Agustinus Ribal, S.Si.,M.Sc., Ph. D, Naimah Aris, S.Si.,M.Math.

Course requirement	Advanced Mathematics, Differential Equations

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
1-2	Able to classify PDP, able to get a general solution, able to get a Fourier series approach forpiecewise continuous function (CPMK-1, CPMK-2, CPMK-3)	**Formative:** Gagal diterjemahkan **Sumative:** Accuracy in classifying PDP. Accuracy in obtaining Fourier series approaches for various functions.	**Formative Criteria:** Accurate understanding and concise answers. **Sumative Criteria:** Independent Assignment (5) dinilai dengan rubrik 01 **Assessment Technique:** Gagal diterjemahkan	**Studying:** Cooperative learning (Cooperative learning) TM: 2x3x50 minutes; PT: 2x3x60; BM: 2x3x50.		College Contract PDP Introduction, PDP Solutions, PDP Classification, Periodic functions and Fourier series.	5
3-4	Able to get a Fourier series approach forvarious periodic functions and recognize the orthogonality properties of Fourier series. Regarding the PDP trichotomy (CPMK-1, CPMK-2, CPMK-3)	**Formative:** Gagal diterjemahkan **Sumative:** Accuracy in explaining periodic functions and their properties. Get to know the orthogonality properties of Fourier series.	**Formative Criteria:** **Sumative Criteria:** Case Studies (10) dinilai dengan rubrik 01 **Assessment Technique:** Gagal diterjemahkan			Periodic function with period 2 Pi, orthogonality properties of the Fourier series, a periodic function with arbitrary period. Second order partial differential equations. Second order PDP trichotomy.	10

5-6	Get to know various kinds of initial value problems, problemslimit values, as well as variable separation methods forsolve the one-dimensional heat equation withzero or constant limits. Capable of transformationPDP to its standard form (CPMK-1, CPMK-2, CPMK-4)	**Formative:** Gagal diterjemahkan **Sumative:** Ability to recognize boundary value problems and initial value problems. Ability to apply variable separation methods for one-dimensional heat equations with zero boundary conditions and constant boundary conditions. Can transform PDP into its standard form.	**Formative Criteria:** **Sumative Criteria:** Case Studies (10) dinilai dengan rubrik 01 **Assessment Technique:** Gagal diterjemahkan			Initial value problems, boundary value problems, variable separation methods to solve equations one-dimensional heat with zero limits and also constant limits. Transformation to its standard form.	10
7-8	Able to solve one-dimensional heat equationswith Laplace transform, Fourier transform and methodsother (CPMK-1, CPMK-2, CPMK-4)	**Formative:** Gagal diterjemahkan **Sumative:** Ability to solve one-dimensional heat equations using transformation methods and methods others.	**Formative Criteria:** **Sumative Criteria:** Case Studies (20) dinilai dengan rubrik 01 **Assessment Technique:** Gagal diterjemahkan			Laplace transform, Fourier transform, Fourier sine transform to solve the one-dimensional heat equation.	20
9-10	Able to solve wave equation onedimensions. Was able to obtain D'Alembert's solution forone-dimensional wave equation (CPMK-1, CPMK-2, CPMK-5, CPMK-6)	**Formative:** Gagal diterjemahkan **Sumative:** Ability to solve one-dimensional wave equations. Ability to obtain the D'Alembert solution for the one-dimensional wave equation.	**Formative Criteria:** **Sumative Criteria:** Case Studies (10) dinilai dengan rubrik 01 **Assessment Technique:** Gagal diterjemahkan			One-dimensional wave equation, D'Alembert solution of one-dimensional wave equation dimensions.	10

11-12	Able to solve the two-dimensional Laplace equationin Cartesian coordinates. Able to completetwo-dimensional Laplace equation in polar coordinates. Obtaining the Poisson solution for the annulus problem of the two-dimensional Laplace equation (CPMK-1, CPMK-2, CPMK-6)	**Formative:** Gagal diterjemahkan **Sumative:** Ability to solve two-dimensional Lapalce equations in coordinates Cartesian, Polar coordinates. Ability to obtain Poisson solutions for two-dimensional Laplace equation annulus problems.	**Formative Criteria:** **Sumative Criteria:** Independent Assignment (10) dinilai dengan rubrik 01 **Assessment Technique:** Gagal diterjemahkan			Two-dimensional Laplace's equation in Cartesian coordinates and polar coordinates, Solution of Laplace's equation in polar coordinates, Solution of two-dimensional Laplace's equation for annulus problems.	10
13-14	Able to solve two-dimensional heat equations,able to solve two-dimensional wave equations (CPMK-1, CPMK-2, CPMK-3, CPMK-4)	**Formative:** Gagal diterjemahkan **Sumative:** Ability to solve two-dimensional heat equations. Ability to solve two-dimensional wave equations.	**Formative Criteria:** **Sumative Criteria:** Independent Assignment (10) dinilai dengan rubrik 01 **Assessment Technique:** Gagal diterjemahkan			Two dimensional heat equation, two wave equation dimensions.	10
15	Get to know numerical methods for solving equationsparcel differential (CPMK-1, CPMK-4, CPMK-5)	**Formative:** Gagal diterjemahkan **Sumative:** Accuracy in using a computer in completing the PDP with the method numeric	**Formative Criteria:** **Sumative Criteria:** Independent Assignment (5) dinilai dengan rubrik 01 **Assessment Technique:** Gagal diterjemahkan			Finite difference method for differential equations partial	5
16	Written Exam						20

	100

Matrix of SLO, CLO, and Assessment Method

SLO / CLO	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5	CLO-6
CPL-1 (ILO 1)	Independent Assignment (Weight 5%) Case Studies (Weight 10%) Case Studies (Weight 10%) Case Studies (Weight 20%) Case Studies (Weight 10%) Independent Assignment (Weight 10%) Independent Assignment (Weight 10%) Independent Assignment (Weight 5%)	Independent Assignment (Weight 5%) Case Studies (Weight 10%) Case Studies (Weight 10%) Case Studies (Weight 20%) Case Studies (Weight 10%) Independent Assignment (Weight 10%) Independent Assignment (Weight 10%)				

SLO / CLO	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5	CLO-6
CPL-2 (P2)	Independent Assignment (Weight 5%) Case Studies (Weight 10%) Case Studies (Weight 10%) Case Studies (Weight 20%) Case Studies (Weight 10%) Independent Assignment (Weight 10%) Independent Assignment (Weight 10%) Independent Assignment (Weight 5%)	Independent Assignment (Weight 5%) Case Studies (Weight 10%) Case Studies (Weight 10%) Case Studies (Weight 20%) Case Studies (Weight 10%) Independent Assignment (Weight 10%) Independent Assignment (Weight 10%)		Case Studies (Weight 10%) Case Studies (Weight 20%) Independent Assignment (Weight 10%) Independent Assignment (Weight 5%)	Case Studies (Weight 10%) Independent Assignment (Weight 5%)	
CPL-3 (KU1)			Independent Assignment (Weight 5%) Case Studies (Weight 10%) Independent Assignment (Weight 10%)	Case Studies (Weight 10%) Case Studies (Weight 20%) Independent Assignment (Weight 10%) Independent Assignment (Weight 5%)	Case Studies (Weight 10%) Independent Assignment (Weight 5%)	

SLO / CLO	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5	CLO-6
CPL-4 (KU2)			Independent Assignment (Weight 5%) Case Studies (Weight 10%) Independent Assignment (Weight 10%)	Case Studies (Weight 10%) Case Studies (Weight 20%) Independent Assignment (Weight 10%) Independent Assignment (Weight 5%)	Case Studies (Weight 10%) Independent Assignment (Weight 5%)	
CPL-5 (KK1)			Independent Assignment (Weight 5%) Case Studies (Weight 10%) Independent Assignment (Weight 10%)	Case Studies (Weight 10%) Case Studies (Weight 20%) Independent Assignment (Weight 10%) Independent Assignment (Weight 5%)		Case Studies (Weight 10%) Independent Assignment (Weight 10%)
CPL-6 (KK2)			Independent Assignment (Weight 5%) Case Studies (Weight 10%) Independent Assignment (Weight 10%)			Case Studies (Weight 10%) Independent Assignment (Weight 10%)

Evaluation Type and Assessment Weight

Type	Assessment Weight
Independent Assignment	30
Case Studies	50
Written Exam	20
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					
				Independent Assignment	Case Studies	Written Exam			
SLO-6	CLO-3	SUB-CLO-1	Accurate understanding and concise answers.	5	0	0	5		
SLO-6	CLO-3	SUB-CLO-2		0	10	0	10		
SLO-5	CLO-4	SUB-CLO-3		0	10	0	10		
SLO-5	CLO-4	SUB-CLO-4		0	20	0	20		
SLO-6	CLO-6	SUB-CLO-5		0	10	5.71	15.71		
SLO-6	CLO-6	SUB-CLO-6		10	0	5.71	15.71		
SLO-5	CLO-4	SUB-CLO-7		10	0	5.71	15.71		
SLO-4	CLO-5	SUB-CLO-8		5	0	2.86	7.86		
				30	50	20	100		

Lampiran Rubrik 01 | ASSESMENT TERTULIS

Kriteria Penilaian	Bobot/Skor Penilaian				
	5	4	3	2	1/0
Konsep/ metode yang digunakan	Penjelasan konsep /metode (*) sangat lengkap dan akurat	Penjelasan konsep/metode (*) cukup jelas tetapi beberapa informasi tidak dituliskan secara lengkap.	Penjelasan konsep/metode (*) kurang jelas dan banyak informasi yang tidak dituliskan	Penjelasan yang dituliskan hampir tidak berkaitan dengan konsep/ metode (*)	Tidak memberikan konsep yang dibutuhkan
Sistematika penulisan/ pembuktian	Sistematika penulisan/ pembuktian sangat jelas dan terstruktur	Sistematika penulisan/ pembuktian cukup jelas namun ada langkah yang hilang	Sistematika penulisan/ pembuktian kurang jelas	Sistematika penulisan/ pembuktian tidak jelas	Jawaban tidak benar/ tidak ada
Interpretasi geometri/ kualitatif/ kuantitatif.	Interpretasi geometri/ kualitatif/ kuantitaBtif (*) tepat dan lengkap	Interpretasi geometri/ kualitatif/ kuantitatif (*) cukup lengkap/ tepat	Interpretasi geometri/ kualitatif/ kuantitatif (*) kurang lengkap/ tepat	Interpretasi geometri/ kualitatif/ kuantitatif(*) tidak lengkap/ tepat	Interpretasi geometri/ kualitatif/kuantitatif(*) tidak benar
Perhitungan/kesimpulan	Perhitungan/ kesimpulan sangat akurat/tepat dan disertai alasan yang mendasarinya	Perhitungan/ kesimpulan cukup akurat/tepat dan disertai alasan yang mendasarinya	Kesimpulan cukup tepat, namun tidak disertai alasan yang jelas	Perhitungan/ kesimpulan kurang akurat/tepat dan tidak disertai alasan yang mendasarinya	Perhitungan/kesimpulan salah