

SEMESTER LEARNING PLAN

**BASIC MATHEMATICS I COURSES
(23H01110103)**



TEACHING TEAM

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STUDI PROGRAM OF MATHEMATICS - S1
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
HASANUDDIN UNIVERSITY
MAKASSAR
2026

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

Mission

To fulfill the vision above, the Bachelor of 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 publications of international reputation.
- Play an active role in community service activities and collaborate with other academic institutions, government, business, media and society.
- Carrying out governance in the Mathematics Study Program in an effective, efficient and transparent manner based on IT and ISO 9001:2015 standards to achieve the tridharma goals.

Graduate Profiles

dapat

PLO charged to courses

CPL-1 (P1) - Students are able to demonstrate an advanced understanding of basic pure and simple applied mathematics.

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

Course Learning Outcomes (CLO)

CPMK-1: Students are able to determine solutions to problems related to the concept of one-change calculus, matrices and systems of linear equations. ()

CPMK-2: Students are able to apply the concepts of function, derivative and integral, as well as matrix operations to solve mathematical problems and problems related to their field of expertise. ()

Sub-CLO

Sub CPMK-1: Students are able to use the properties of real numbers and functions in determining the domain and range of functions, as well as the solution set for root, square and absolute value inequalities. ()

Sub CPMK-2: Students are able to describe functions through algebraic operations and through graphs. ()

Sub CPMK-3: ()

Sub CPMK-4: Students are able to solve integrals using the Riemann sum limit approach as well as using various integration techniques, such as substitution, partials, rational functions, trigonometric substitution, and other techniques. ()

Sub CPMK-5: Students are able to apply integrals in geometric and physical problems, such as area, curve length, volume and surface area of rotating objects, and center of gravity of a plane. ()

Sub CPMK-6: Students are able to solve systems of linear equations by utilizing the basic properties and operations of matrices, including determinants, inverses, and elementary row operations. ()

Learning Analytics

Basic Mathematics I



Students are able to solve systems of linear equations by utilizing the basic properties and operations of matrices, including determinants, inverses, and elementary row operations. (CPMK-2)



Students are able to apply integrals in geometric and physical problems, such as area, curve length, volume and surface area of rotating objects, and center of gravity of a plane. (CPMK-2)



Students are able to solve integrals using the Riemann sum limit approach as well as using various integration techniques, such as substitution, partials, rational functions, trigonometric substitution, and other techniques. (CPMK-1)



(CPMK-2)



Students are able to describe functions through algebraic operations and through graphs. (CPMK-1)



Students are able to use the properties of real numbers and functions in determining the domain and range of functions, as well as the solution set for root, square and absolute value inequalities. (CPMK-1)

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HASANUDDIN UNIVERSITY

FAKULTY OF MATHEMATICS AND NATURAL SCIENCES

STUDY PROGRAM OF MATHEMATICS - S1

SEMESTER LEARNING PLAN

Course		Code	Course Group	Credits	SEMESTER	Compilation Date
Basic Mathematics I		23H01110103	Basic Science	3	1	1 Agustus 2024
AUTHORITY		SLP Developer Lecturer	Coordinator		Head of Study Program	
		Jusmawati Massalesse, S.Si.,M.Si., Naimah Aris, S.Si.,M.Math.	Jusmawati Massalesse, S.Si.,M.Si.		Dr. Firman, S.Si.,M.Si.	
Learning Outcomes Course	SLOs that are imposed on the course					
	SLO-1:	Mahasiwa memiliki pemahaman yang relatif mendalam dalam matematika murni dan matematika terapan sederhana.				
	SLO-3:	Mahasiswa mampu menganalisis suatu masalah matematika dengan logika, analitik, dan struktur sistematis				
	SLO ⇒ Course Learning Outcomes					
	After completing this course, it is expected:					
	CLO ⇒ Sub-CLO					
	CLO-1	Sub-CLO-1:Students are able to use the properties of real numbers and functions in determining the domain and range of functions, as well as the solution set for root, square and absolute value inequalities.				
		Sub-CLO-2:Students are able to describe functions through algebraic operations and through graphs.				
		Sub-CLO-4:Students are able to solve integrals using the Riemann sum limit approach as well as using various integration techniques, such as substitution, partials, rational functions, trigonometric substitution, and other techniques.				
	CLO-2	Sub-CLO-3:				
		Sub-CLO-5:Students are able to apply integrals in geometric and physical problems, such as area, curve length, volume and surface area of rotating objects, and center of gravity of a plane.				
		Sub-CLO-6:Students are able to solve systems of linear equations by utilizing the basic properties and operations of matrices, including determinants, inverses, and elementary row operations.				
	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						
				Kuls	Independent Assignment	Mid Test	Final Test			
SLO-	CLO-1	SUB-CLO-1	None	4	5	6.67	0	15.67		
SLO-	CLO-1	SUB-CLO-2		5	4	6.67	0	15.67		
SLO-	CLO-2	SUB-CLO-3		6	6	6.67	0	18.67		
SLO-	CLO-1	SUB-CLO-4		5	4	0	6.67	15.67		
SLO-	CLO-2	SUB-CLO-5		4	5	0	6.67	15.67		
SLO-	CLO-2	SUB-CLO-6		6	6	0	6.67	18.67		
				30	30	20	20	100		
Course Description	This course equips students with basics of one-variable calculus and systems of linear equations through approximation analytics and visuals. Material includes real number systems, functions and graphs, limits and continuity, derivatives and their applications, indefinite integrals and of course, as well as matrix-based systems of linear equations. Learning emphasizes logical, deductive and systematic reasoning, and strengthen understanding conceptual through interactive lectures, group discussions, and case studies. Some enrichment topics like graph transformations, integration techniques continuation, as well as solving SPL using determinants and inverses tailored to the needs and depth of learning outcomes.									
Learning Materials/Subjects	- Fungsi polinomial, Fungsi-fungsi khusus, Logaritma, eksponen dan trigonometri.									
Reference	Main References									
	1. Thomas G.B., Weir, M.D. , Hass, J.R. “Thomas Calculus early transcendentals (13th Edition)”, Pearson. 2013.									
	2. Chris McMullen, “Essential Calculus Skills Practice Workbook with Full Solutions”, Zishka Publishing, 2018.									
	3. James Stewart, Single Variable Calculus: Early Transcendentals, Thomson Brooks/Cole, 2015.									
	4. Mathematics Lecturer Team, "Basic Mathematics", 2023.									
	Additional References									
	Khan Academy: https://www.khanacademy.org/math/calculus-1 .									
	Mathematics Lecture Series - Prof. Hendra Gunawan Bandung Institute of Technology,									
Teaching Team	Jusmawati Massalesse, S.Si.,M.Si., Naimah Aris, S.Si.,M.Math., Edy Saputra Rusdy , S.Si., M.Si.									
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
1-2	Students are able to use the properties of real numbers and functions in determining the domain and range of functions, as well as the solution set for root, square and absolute value inequalities. (CPMK-1)	Formative: Sumative: dalam menginterpretasikan bentuk akar dan nilai mutlak, serta dalam menyelesaikan ketaksamaan yang melibatkan keduanya.	Formative Criteria: None Sumative Criteria: Quiz (4) dinilai dengan rubrik 01 Independent Assignment (5) dinilai dengan rubrik 01 Assessment Technique: Test and Non-Test	Studying: Case Study, Cooperative learning 2x3x50		Fungsi, domain dan range, operasi aljabar dan komposisi fungsi, fungsi-fungsi khusus dan polinom, fungsi transenden, grafik fungsi dan pergeserannya terhadap sumbu koordinat.	9
3-4	Students are able to describe functions through algebraic operations and through graphs. (CPMK-1)	Formative: - Sumative: 1.	Formative Criteria: Sumative Criteria: Quiz (5) dinilai dengan rubrik 01 Independent Assignment (4) dinilai dengan rubrik 01 Assessment Technique: Test and Non-Test	Studying: Case Study, Cooperative learning 2x3x50		Limits and Continuity of Functions Limits and Theorems Limit theorems, Continuity and its conditions [1] pg 59-1104 [3] pg 78-138 [4] pg 47-59	9

5-7	(CPMK-2)	Formative: - Sumative: Ketepatan mendapatkan turunan tingkat tinggi fungsi eksplisit dan fungsi implisit yang diberikan	Formative Criteria: Sumative Criteria: Tugas Mandiri (6) dinilai dengan rubrik 01 Quiz (6) dinilai dengan rubrik 01 Assessment Technique: Test and Non-Test	Studying: Cooperative learning (Cooperative learning) 3x3x50		turunan fungsi komposisi, fungsi implisit dan turunan orde tinggi	12
8	MIDTERM EXAM						20
9-10	Students are able to solve integrals using the Riemann sum limit approach as well as using various integration techniques, such as substitution, partials, rational functions, trigonometric substitution, and other techniques. (CPMK-1)	Formative: - Sumative: 2.	Formative Criteria: Sumative Criteria: Quiz (5) dinilai dengan rubrik 01 Independent Assignment (4) dinilai dengan rubrik 01 Assessment Technique: None	Kuliah: Pembelajaran kolaboratif (Collaborative Learning) 2x3x50	Studying: Problem Based Learning (Problem-based Learning) 2x3x60	Integral Tak Tentu dan Integral Tentu	9
11-12	Students are able to apply integrals in geometric and physical problems, such as area, curve length, volume and surface area of rotating objects, and center of gravity of a plane. (CPMK-2)	Formative: - Sumative: 1.	Formative Criteria: Sumative Criteria: Quiz (4) dinilai dengan rubrik 01 Independent Assignment (5) dinilai dengan rubrik 01 Assessment Technique: Test and Non-Test	Studying: Pembelajaran kolaboratif (Collaborative Learning) - 2x3x50	Kuliah: Problem Based Learning (Problem-based Learning) - 2x3x50	Luas daerah tertutup di bawah kurva-kurva, nilai rata-rata, panjang kurva dan titik massa lamina. [1] hal 365 - 404 [3] hal 428-461 [4] hal 142-151	9

13-15	Students are able to solve systems of linear equations by utilizing the basic properties and operations of matrices, including determinants, inverses, and elementary row operations. (CPMK-2)	Formative: - Sumative: termasuk penjumlahan, perkalian, dan transpose.	Formative Criteria: Sumative Criteria: Quiz (6) dinilai dengan rubrik 01 Independent Assignment (6) dinilai dengan rubrik 01 Assessment Technique: Test and Non-Test	Studying: Collaborative learning (Collaborative Learning) 3x3x50	Studying: Problem Based Learning (Problem-based Learning) - 3x3x60	Matrix Operations on matrices Inverse Determinant Systems of Linear Equations Completion of SPL by: [if !supportLists]- [endif]Inverse Method - Determinant Method - Gaussian method [5]: pg 2 -123	12
16	FINAL EXAMS						20
							100

Matrix of SLO, CLO, and Assessment Method

SLO / CLO	CLO-1	CLO-2
CPL-1 (P1)		
CPL-3 (KU1)		

Evaluation Type and Assessment Weight

Type	Assessment Weight
Quiz	30
Independent Assignment	30
Mid Test	20
Final Test	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						
				Quiz	Independent Assignment	Mid Test	Final Test			
SLO-	CLO-1	SUB-CLO-1	None	4	5	6.67	0	15.67		
SLO-	CLO-1	SUB-CLO-2		5	4	6.67	0	15.67		
SLO-	CLO-2	SUB-CLO-3		6	6	6.67	0	18.67		
SLO-	CLO-1	SUB-CLO-4		5	4	0	6.67	15.67		
SLO-	CLO-2	SUB-CLO-5		4	5	0	6.67	15.67		
SLO-	CLO-2	SUB-CLO-6		6	6	0	6.67	18.67		
				30	30	20	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/ kuantitatif (*) 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