

SEMESTER LEARNING PLAN

**SIZE & OPPORTUNITY THEORY COURSES
(23H01131503)**



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

Mission

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-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-7 (KK3) - The students are able to demonstrate mathematical skills which include interpretation, connecting problems, solving problems, and communicating individually or teamwork

Course Learning Outcomes (CLO)

CPMK-1: Students are expected to have an understanding of set notation and operations on sets, set algebra, sigma algebra. (CPL3 dan CPL4)

CPMK-2: Students are expected to have an understanding of properties, size spaces, probability spaces, outer sizes. (CPL4 dan CPL7)

CPMK-3: Students are expected to have an understanding of measurable functions, distribution functions, Lebesgue integrals. (CPL3, CPL4 dan CPL7)

Sub-CLO

Sub CPMK-1: Students are able to explain and describe the meaning and symbols of sets' functions, countable and uncountable sets, sample space, probability theory and size theory. (CPMK-1)

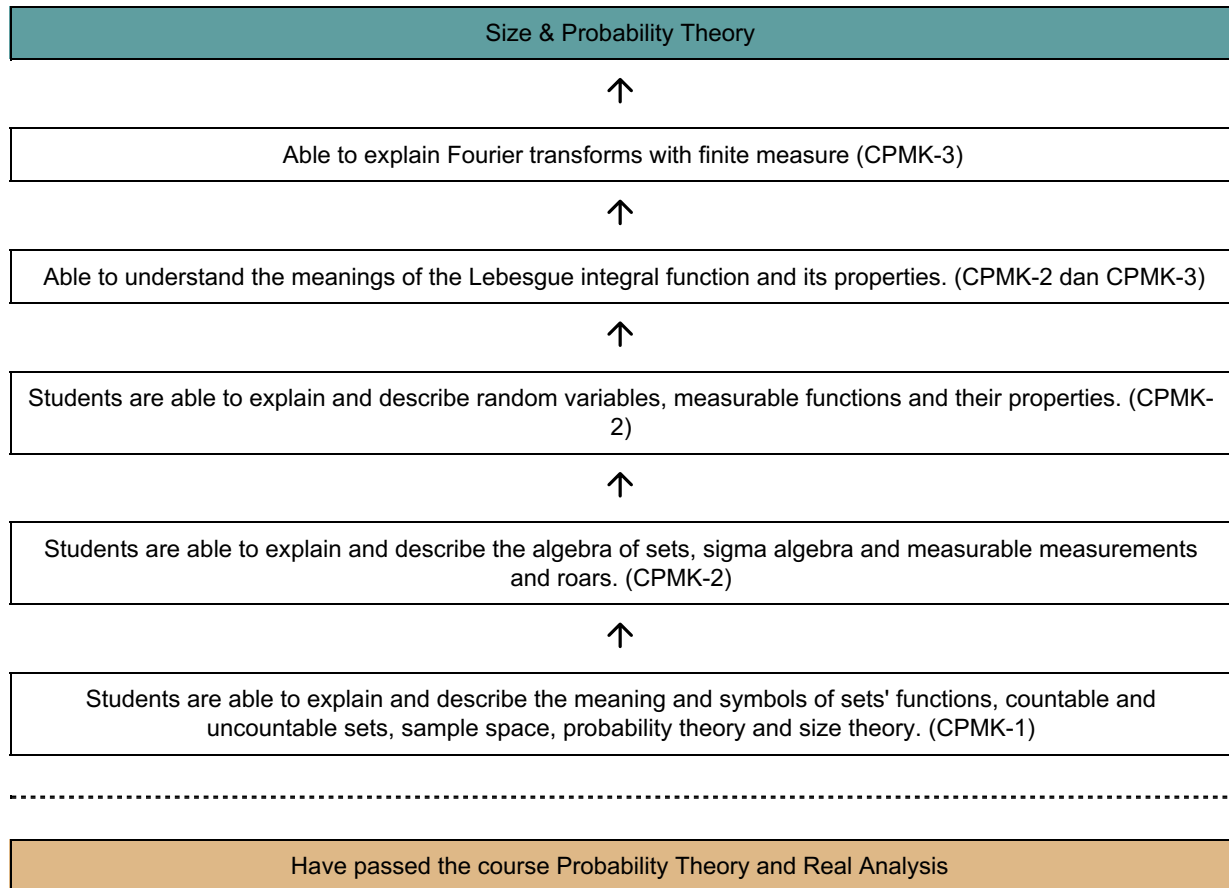
Sub CPMK-2: Students are able to explain and describe the algebra of sets, sigma algebra and measurable measurements and roars. (CPMK-2)

Sub CPMK-3: Students are able to explain and describe random variables, measurable functions and their properties. (CPMK-2)

Sub CPMK-4: Able to understand the meanings of the Lebesgue integral function and its properties. (CPMK-2 dan CPMK-3)

Sub CPMK-5: Able to explain Fourier transforms with finite measure (CPMK-3)

Learning Analytics





HASANUDDIN UNIVERSITY

FAKULTY OF MATHEMATICS AND NATURAL SCIENCES

STUDY PROGRAM OF MATHEMATICS - S1

SEMESTER LEARNING PLAN

Course		Code	Course Group	Credits	SEMESTER	Compilation Date
Size & Probability Theory		23H01131503	Analysis	3	5	11 Agustus 2025
AUTHORITY		SLP Developer Lecturer	Coordinator		Head of Study Program	
		Prof. Dr. Eng. Mawardi, S.Si., M.Si., Dr. Muh. Nur, S.Si., M.Si.	Dr. Muh. Nur, S.Si., M.Si.		Dr. Firman, S.Si.,M.Si.	
Learning Outcomes Course	SLOs that are imposed on the course					
	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-7:	Mahasiswa dapat menunjukkan keterampilan matematika termasuk menghubungkan masalah, menyelesaikan masalah, interpretasi, dan berkomunikasi secara individu atau dengan kerja tim				
	SLO ⇒ Course Learning Outcomes					
	After completing this course, it is expected:					
	SLO-3	CLO-1: Students are expected to have an understanding of set notation and operations on sets, set algebra, sigma algebra.				
		CLO-3: Students are expected to have an understanding of measurable functions, distribution functions, Lebesgue integrals.				
	SLO-4	CLO-1: Students are expected to have an understanding of set notation and operations on sets, set algebra, sigma algebra.				
		CLO-2: Students are expected to have an understanding of properties, size spaces, probability spaces, outer sizes.				
		CLO-3: Students are expected to have an understanding of measurable functions, distribution functions, Lebesgue integrals.				
	SLO-7	CLO-2: Students are expected to have an understanding of properties, size spaces, probability spaces, outer sizes.				
		CLO-3: Students are expected to have an understanding of measurable functions, distribution functions, Lebesgue integrals.				
	CLO ⇒ Sub-CLO					
	CLO-1	Sub-CLO-1:Students are able to explain and describe the meaning and symbols of sets' functions, countable and uncountable sets, sample space, probability theory and size theory.				
		Sub-CLO-2:Students are able to explain and describe the algebra of sets, sigma algebra and measurable measurements and roars.				

		CLO-2		Sub-CLO-3:Students are able to explain and describe random variables, measurable functions and their properties.						
				Sub-CLO-4:Able to understand the meanings of the Lebesgue integral function and its properties.						
		CLO-3		Sub-CLO-4:Able to understand the meanings of the Lebesgue integral function and its properties.						
				Sub-CLO-5:Able to explain Fourier transforms with finite measure						
		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						
				Case Studies	Written Exam	Written Exam				
SLO-4	CLO-1	SUB-CLO-1	discipline, perseverance, activeness		10	10	0	20		
SLO-7	CLO-2	SUB-CLO-3	discipline, perseverance, activeness		10	10	0	20		
SLO-7	CLO-3	SUB-CLO-4	discipline, perseverance, activeness and discipline, perseverance, activeness		20	0	10	30		
SLO-7	CLO-3	SUB-CLO-5	discipline, perseverance, activeness and discipline, perseverance, activeness		20	0	10	30		
					60	20	20	100		
Course Description		This course covers the development of mathematical analysis and statistics: Theory size and probability have an important role in the development of integral theory, probability theory and statistics, Fourier analysis, functional analysis, topology, geometry, quantum physics, etc.								
Learning Materials/Subjects		1. Set Theory 2. Set Algebra, Sigma Algebra and measurable spaces 3. Random Variables and Measurable Functions 4. Lebesgue integral 5. Fourier Transform								
		Main References								

Reference		1. M. Brokate and G. Kersting, Measure and Integral, Springer, 2015. 2. Marek Capinski and Ekkehard Kopp, Measure, Integral and Probability, Springer-Verlag, 2004. 3. Ekasasmita, W.; Bahri, M.; Bachtiar, N.; Rahim, A.; Nur, M. One-Dimensional Quaternion Fourier Transform with Application to Probability Theory. <i>Symmetry</i> 2023 , <i>15</i> , 815. https://doi.org/10.3390/sym15040815 .					
		Additional References					
		1. Nurwahidah, Bahri, M and Rahim A. :Two-dimensional quaternion fourier transform method in probability modeling Symmetry 2024, 16, 257. https://doi.org/10.3390/sym16030257 2. Billingsley, P. (1995). Probability and measurement (3rd ed.). Wiley.					
Teaching Team		Prof. Dr. Eng. Mawardi, S.Si., M.Si., Dr. Muh. Nur, S.Si., M.Si.					
Course requirement		Probability Theory, Real Analysis					
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 explain and describe the meaning and symbols of sets' functions, countable and uncountable sets, sample space, probability theory and size theory. (CPMK-1)	Formative: accuracy of understanding Sumative: Ability to explain and describe the meaning and symbols of a set, function, opportunity and size	Formative Criteria: discipline, perseverance, activeness dinilai dengan rubrik 01 Sumative Criteria: Case Studies (10) dinilai dengan rubrik 01 Assessment Technique: Test and Non-Test	Studying: Case Study, Collaborative Learning, Other methods 2X3X50		Lecture contracts, Sets and functions, introduction to probability theory and theory size.	10

3-5	Able to explain Fourier transforms with finite measure (CPMK-3)	Formative: accuracy of understanding Sumative: Ability to explain and describe set algebra, algebra sigma and measured size and space	Formative Criteria: discipline, perseverance, activeness dinilai dengan rubrik 01 Sumative Criteria: Case Studies (10) dinilai dengan rubrik 01 Assessment Technique: Test and Non-Test	Studying: Group discussion (Small Group Discussion), Case Study (Case Study), Collaborative Learning (Collaborative Learning) 2X3X50		Algebra of Sets, Algebra of Sigma and Measures, Space measurable	10
6-7	Students are able to explain and describe random variables, measurable functions and their properties. (CPMK-2)	Formative: accuracy of understanding Sumative: Ability to explain and describe random variables, measurable functions and its properties	Formative Criteria: discipline, perseverance, activeness dinilai dengan rubrik 02 Sumative Criteria: Case Studies (10) dinilai dengan rubrik 02 Assessment Technique: Test and Non-Test	Studying: Group discussion (Small Group Discussion), Case Study (Case Study) 2X3X50		Measurable functions and their properties	10
8	Written Exam						20

9-10	Able to understand the meanings of the Lebesgue integral function and its properties. (CPMK-2, CPMK-3)	Formative: accuracy of understanding Sumative: -the ability to explain and describe the Lebesgue integral function and its properties	Formative Criteria: discipline, perseverance, activeness dinilai dengan rubrik 01 Sumative Criteria: Case Studies (10) dinilai dengan rubrik 01 Assessment Technique: Test and Non-Test	Studying: Group discussion (Small Group Discussion), Case Study (Case Study), Collaborative Learning (Collaborative Learning) 2X3X50		Measurable functions and probability functions (Supporting [1])	10
11-12	Able to understand the meanings of the Lebesgue integral function and its properties. (CPMK-2, CPMK-3)	Formative: accuracy of understanding Sumative: Ability to explain and describe the properties of the Lebesgue Integral	Formative Criteria: discipline, perseverance, activeness dinilai dengan rubrik 01 Sumative Criteria: Case Studies (10) dinilai dengan rubrik 01 Assessment Technique: Test and Non-Test	Studying: Group discussion (Small Group Discussion), Case Study (Case Study) 2X3X50		Lebesgue integral	10
13-15	Able to explain Fourier transforms with finite measure (CPMK-3)	Formative: accuracy of understanding Sumative: the ability to explain and describe the Fourier transform and its properties	Formative Criteria: discipline, perseverance, activeness dinilai dengan rubrik 01 Sumative Criteria: Case Studies (10) dinilai dengan rubrik 01 Assessment Technique: Test and Non-Test	Studying: Group discussion (Small Group Discussion), Case Study (Case Study) 2X3X50		Fourier Transform	10

16	Written Exam	20
		100

Matrix of SLO, CLO, and Assessment Method

SLO / CLO	CLO-1	CLO-2	CLO-3
CPL-3 (KU1)	Case Studies (Weight 10%)		Case Studies (Weight 20%) Case Studies (Weight 20%)
CPL-4 (KU2)	Case Studies (Weight 10%)	Case Studies (Weight 10%) Case Studies (Weight 20%)	Case Studies (Weight 20%) Case Studies (Weight 20%)
CPL-7 (KK3)		Case Studies (Weight 10%) Case Studies (Weight 20%)	Case Studies (Weight 20%) Case Studies (Weight 20%)

Evaluation Type and Assessment Weight

Type	Assessment Weight
Case Studies	60
Written Exam	20
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					
				Case Studies	Written Exam	Written Exam			
SLO-4	CLO-1	SUB-CLO-1	discipline, perseverance, activeness	10	10	0	20		
SLO-7	CLO-2	SUB-CLO-3	discipline, perseverance, activeness	10	10	0	20		
SLO-7	CLO-3	SUB-CLO-4	discipline, perseverance, activeness and discipline, perseverance, activeness	20	0	10	30		
SLO-7	CLO-3	SUB-CLO-5	discipline, perseverance, activeness and discipline, perseverance, activeness	20	0	10	30		
				60	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

Lampiran Rubrik 02 | ASSESMENT PRESENTASI

Kriteria Penilaian	Bobot/Skor Penilaian				
	5	4	3	2	1
Penguasaan Materi	Mahasiswa sangat menguasai materi	Mahasiswa menguasai materi	Mahasiswa cukup menguasai materi	Mahasiswa kurang menguasai materi	Mahasiswa tidak menguasai materi
Sistematika Penyajian	Mahasiswa menyajikan materi presentasi dengan sangat sistematis	Mahasiswa menyajikan materi presentasi dengan sistematis	Mahasiswa menyajikan materi presentasi dengan cukup sistematis	Mahasiswa menyajikan materi presentasi dengan kurang sistematis	Mahasiswa menyajikan materi presentasi dengan tidak sistematis
Suara dan Ekspresi	Mahasiswa menjelaskan dengan suara yang sangat jelas, volume yang sangat sesuai, pengucapan istilah sangat tepat	Mahasiswa menjelaskan dengan suara yang jelas, volume yang sesuai, pengucapan istilah tepat	Mahasiswa menjelaskan dengan suara yang cukup jelas, volume yang cukup sesuai, pengucapan istilah cukup tepat	Mahasiswa menjelaskan dengan suara yang kurang jelas, volume yang kurang sesuai, pengucapan istilah kurang tepat	Mahasiswa menjelaskan dengan suara yang tidak jelas, volume yang tidak sesuai, pengucapan istilah tidak tepat
Kepercayaan Diri	Mahasiswa berbicara dengan sangat semangat, menularkan semangat dan antusiasme pada pendengar, eye contact ke semua peserta (audience)	Mahasiswa berbicara dengan semangat, menularkan semangat dan antusiasme pada pendengar, eye contact ke semua peserta (audience)	Mahasiswa berbicara dengan cukup semangat, cukup menularkan semangat dan antusiasme pada pendengar, eye contact ke semua peserta (audience)	Mahasiswa berbicara dengan kurang semangat, kurang menularkan semangat dan antusiasme pada pendengar, eye contact yang kurang ke semua peserta (audience)	Mahasiswa berbicara dengan tidak semangat, tidak dapat menularkan semangat dan antusiasme pada pendengar, tidak ada eye contact ke semua peserta (audience)
Kemampuan menjawab pertanyaan	Mahasiswa mampu menjawab semua pertanyaan dengan sangat tepat, sangat mendalam (lebih dari yang dibutuhkan), dan sangat tajam	Mahasiswa mampu menjawab semua pertanyaan dengan tepat, mendalam (lebih dari yang dibutuhkan), dan tajam	Mahasiswa mampu menjawab semua pertanyaan dengan cukup tepat, cukup mendalam, dan cukup tajam	Mahasiswa mampu menjawab semua pertanyaan dengan kurang tepat, kurang mendalam, dan kurang tajam	Mahasiswa mampu menjawab semua pertanyaan dengan tidak tepat, tidak mendalam, dan tidak tajam
Keperimpinan presentasi kelompok)	Mahasiswa sangat mampu menginisiasi, menggerakkan, mengarahkan, mengorganisir jalannya presentasi	Mahasiswa mampu menginisiasi, menggerakkan, mengarahkan, mengorganisir jalannya presentasi	Mahasiswa cukup mampu menginisiasi, menggerakkan, mengarahkan, mengorganisir jalannya presentasi	Mahasiswa kurang mampu menginisiasi, menggerakkan, mengarahkan, mengorganisir jalannya presentasi	Mahasiswa tidak mampu menginisiasi, menggerakkan, mengarahkan, mengorganisir jalannya presentasi