

SEMESTER LEARNING PLAN

**SPECIAL TOPICS IN COMBINATORICS COURSES
(23H01131803)**



TEACHING TEAM

Prof. Dr. Hasmawati, M.Si.
196412311990032007

Prof. Dr. Nurdin, S.Si., M.Si.
197008072000031002

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-8 (S1) - The students have integrity that highly values the supreme divinity, social responsibility, and professional ethics

CPL-9 (S2) - The students are able to adapt and develop self-abilities, both in mathematics and other relevant areas of science in their professional lives

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

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 able to solve simple problems about Ramey numbers, labeling, dimensional metrics or dimensional partitions. (CPL6 dan CPL7)

CPMK-2: Students are able to compile the state of the art of a research topic in a structured and grammatical manner. (CPL8 dan CPL6)

CPMK-3: . (CPL8 dan CPL7)

CPMK-4: Students are able to convey state of the art by internalizing academic values, norms and ethics. (CPL9)

Sub-CLO

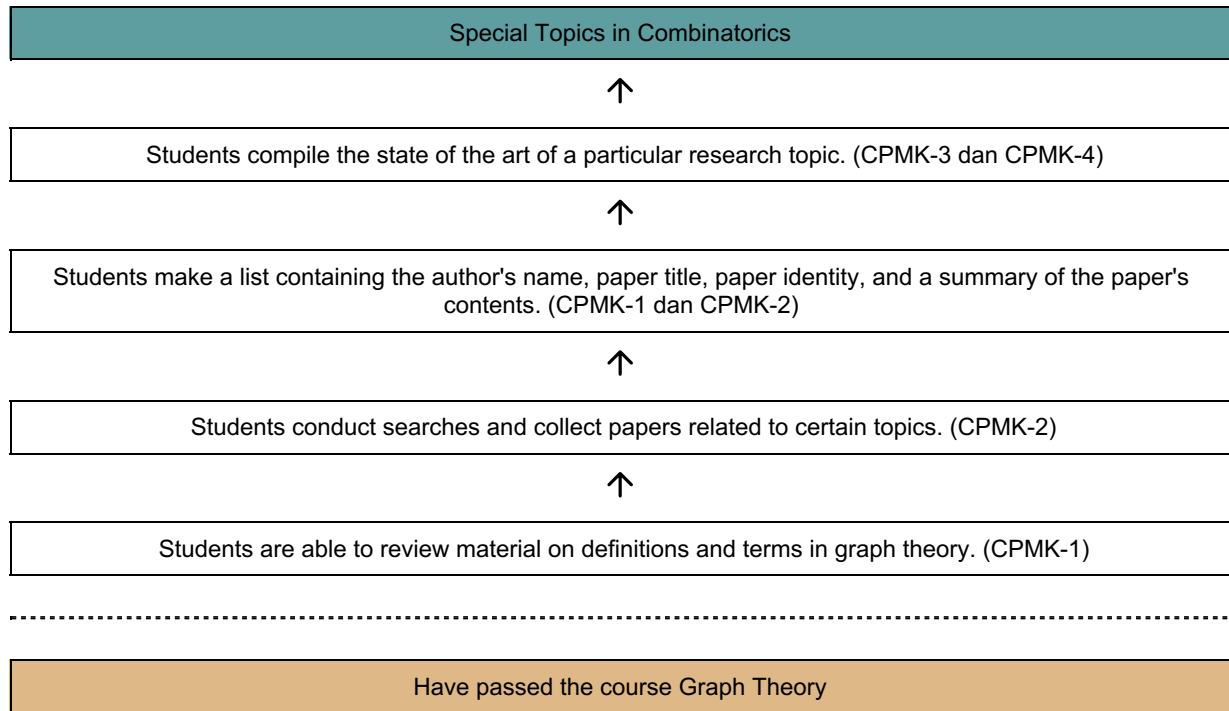
Sub CPMK-1: Students are able to review material on definitions and terms in graph theory. (CPMK-1)

Sub CPMK-2: Students conduct searches and collect papers related to certain topics. (CPMK-2)

Sub CPMK-3: Students make a list containing the author's name, paper title, paper identity, and a summary of the paper's contents. (CPMK-1 dan CPMK-2)

Sub CPMK-4: Students compile the state of the art of a particular research topic. (CPMK-3 dan CPMK-4)

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
Special Topics in Combinatorics		23H01131803	ALGEBRA AND COMBINATORICS	3	5	16 Agustus 2025
AUTHORITY		SLP Developer Lecturer	Coordinator		Head of Study Program	
		Prof. Dr. Hasmawati, M.Si., Prof. Dr. Nurdin, S.Si., M.Si.	Prof. Dr. Hasmawati, M.Si.		Dr. Firman, S.Si.,M.Si.	
Learning Outcomes Course	SLOs that are imposed on the course					
	SLO-8:	Mahasiswa memiliki integritas yang sangat menghargai keilahian tertinggi, tanggung jawab sosial, dan etika profesional				
	SLO-9:	Mahasiswa dapat beradaptasi dan mengembangkan kemampuan diri, baik dalam matematika dan bidang ilmu lain yang relevan dalam kehidupan profesional mereka, dengan budaya belajar sepanjang hayat				
	SLO-6:	Mahasiswa dapat menerapkan metode matematika untuk memecahkan masalah terkait matematika dengan atau tanpa bantuan komputer dan perangkat lunak				
	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-6	CLO-1: Students are able to solve simple problems about Ramey numbers, labeling, dimensional metrics or dimensional partitions.				
		CLO-2: Students are able to compile the state of the art of a research topic in a structured and grammatical manner.				
	SLO-7	CLO-1: Students are able to solve simple problems about Ramey numbers, labeling, dimensional metrics or dimensional partitions.				
		CLO-3: .				
	SLO-8	CLO-2: Students are able to compile the state of the art of a research topic in a structured and grammatical manner.				
		CLO-3: .				
	SLO-9	CLO-4: Students are able to convey state of the art by internalizing academic values, norms and ethics.				
	CLO ⇒ Sub-CLO					
	CLO-1	Sub-CLO-1:Students are able to review material on definitions and terms in graph theory.				

		Sub-CLO-3:Students make a list containing the author's name, paper title, paper identity, and a summary of the paper's contents.							
	CLO-2	Sub-CLO-2:Students conduct searches and collect papers related to certain topics.							
		Sub-CLO-3:Students make a list containing the author's name, paper title, paper identity, and a summary of the paper's contents.							
	CLO-3	Sub-CLO-4:Students compile the state of the art of a particular research topic.							
	CLO-4	Sub-CLO-4:Students compile the state of the art of a particular research topic.							
	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				
					Short Q&A				Project Report
SLO-7		CLO-	SUB-CLO-1		5	0	5		
SLO-7		CLO-1	SUB-CLO-1		0	10	10		
SLO-6		CLO-2	SUB-CLO-2		0	15	15		
SLO-6		CLO-2	SUB-CLO-3		0	35	35		
SLO-9		CLO-4	SUB-CLO-4		0	35	35		
					5	95	100		
Course Description		Learning Special Topics in Mathematics focuses on distance and center in graphs, introduction Metric dimensions, partition dimensions, introduction to Ramsey theory and labeling							
Learning Materials/Subjects		1. Learning Contract, RPS, distance and center of a graph 2. Introduction to Metric Dimension 3. Introduction to partition Dimension 4. Introduction to differential graphs, 5. Introduction to Ramsey Theory (Ramsey numbers of graphs, Size Ramsey numbers, graph-critical Ramsey number, rainbow Ramsey number, Multipartite Ramsey numbers) 6. Introduction to Labeling in graphs							
Reference		Main References							
		Gagal diterjemahkan							
		Additional References							

1. Reinhard Diestel (2000), Graph Theory, Graduate Texts In Mathematics, Springer.
2. Prof. Dr. Hasmawati, M.Si (2020), INTRODUCTION TO THEORY AND TYPES OF GRAPHICS, UPT Unhas Press.
3. Ronald L. Graham, Bruce H. Rothschild, Joel H. Spencer. Ramsey Theory, JOHN WILEY & SONS, New York.
4. Reinhard Diestel (2000), Graph Theory, Graduate Texts In Mathematics, Springer.
5. Rector's Regulation number 29/UN4.1/2023 concerning the Implementation of Hasanuddin University Undergraduate Programs

Teaching Team		Prof. Dr. Hasmawati, M.Si., Prof. Dr. Nurdin, S.Si., M.Si.					
Course requirement		Graph Theory					
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	Students understand the objectives of the lecture and know the students' initial abilities. ()	Formative: Sumative: Students' ability to carry out student commitments and accuracy in answering questions	Formative Criteria: Sumative Criteria: Short Q&A (5) dinilai dengan rubrik 04 Assessment Technique: Non Test	Studying: Other methods Lecture while discussing 3 x 45 minutes Studying: Discovery Learning 3 x 45 minutes		Graph terminology and convention rules used during learning.	5

2-3	Students conduct searches and collect papers related to certain topics. (CPMK-2)	Formative: Students have the ability to search for literature related to lecture material Sumative: Student's accuracy in explaining the definition of Ramsey numbers, metric dimensions, dimensional partitions or labeling and can provide examples	Formative Criteria: Sumative Criteria: Project Report (15) dinilai dengan rubrik 01 Assessment Technique: Gagal diterjemahkan	Studying: Self-Directed Learning 3 x meetings		Graph labeling, proper reference tracking methods and updates. (Main [1])	15
4-5	Students make a list containing the author's name, paper title, paper identity, and a summary of the paper's contents. (CPMK-1, CPMK-2)	Formative: Gagal diterjemahkan Sumative: Students have a chosen topic	Formative Criteria: Sumative Criteria: Project Report (15) dinilai dengan rubrik 01 Assessment Technique: Non Test	Response and Tutorial: Case Study (Case Study) 3 x 45 minutes		Reference writing method	15
6-8	Students compile the state of the art of a particular research topic. (CPMK-3, CPMK-4)	Formative: Gagal diterjemahkan Sumative: Students receive a minimum of 5 updated papers related to the chosen topic.	Formative Criteria: Sumative Criteria: Project Report (15) dinilai dengan rubrik 01 Assessment Technique: Non Test	Other Forms: Other methods 2 meetings		State of the art method for graph labeling topics	15

9-10	Students are able to review material on definitions and terms in graph theory. (CPMK-1)	Formative: Gagal diterjemahkan Sumative: Students have found open problems related to the chosen topic.	Formative Criteria: Sumative Criteria: Project Report (10) dinilai dengan rubrik 01 Assessment Technique: Gagal diterjemahkan	Research, Design, or Development: Case Study (Case Study) 2 x meetings		Ramsey number, graph differential, metric dimension, and partition dimension	10
11-13	Students make a list containing the author's name, paper title, paper identity, and a summary of the paper's contents. (CPMK-1, CPMK-2)	Formative: Gagal diterjemahkan Sumative: Students have a proposal about one of the metric dimensions, partition dimensions, or Ramsey number, or labeling	Formative Criteria: Sumative Criteria: Project Report (20) dinilai dengan rubrik 01 Assessment Technique: Gagal diterjemahkan	Research, Design, or Development: Case Study (Case Study) 4 meetings		Reference search methods and how to compile references.	20
14-16	Students compile the state of the art of a particular research topic. (CPMK-3, CPMK-4)	Formative: Gagal diterjemahkan Sumative: Students are able to draft a Final Assignment research proposal and a presentation regarding the proposal made.	Formative Criteria: Sumative Criteria: Project Report (20) dinilai dengan rubrik 01 Assessment Technique: Gagal diterjemahkan	Research, Design, or Development: Case Study (Case Study) 3 x meetings		Creation of a state of the art one of the research topics regarding Ramsey numbers, differential graphs, dimensional metrics, or partition dimensions.	20
							100

Matrix of SLO, CLO, and Assessment Method

SLO / CLO	CLO-1	CLO-2	CLO-3	CLO-4
CPL-6 (KK2)	Project Report (Weight 10%) Project Report (Weight 35%)	Project Report (Weight 15%) Project Report (Weight 35%)		
CPL-7 (KK3)	Project Report (Weight 10%) Project Report (Weight 35%)		Project Report (Weight 35%)	
CPL-8 (S1)		Project Report (Weight 15%) Project Report (Weight 35%)	Project Report (Weight 35%)	
CPL-9 (S2)				Project Report (Weight 35%)

Evaluation Type and Assessment Weight

Type	Assessment Weight
Short Q&A	5
Project Report	95
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				
				Short Q&A	Project Report			
SLO-7	CLO-	SUB-CLO-1		5	0	5		
SLO-7	CLO-1	SUB-CLO-1		0	10	10		
SLO-6	CLO-2	SUB-CLO-2		0	15	15		
SLO-6	CLO-2	SUB-CLO-3		0	35	35		
SLO-9	CLO-4	SUB-CLO-4		0	35	35		
				5	95	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 04 | ASSESMENT DISKUSI

Kriteria Penilaian	Bobot/Skor Penilaian				
	5	4	3	2	1
Kelugasan argumen	Mahasiswa menyampaikan pendapat menggunakan bahasa yang sangat baik, sangat mudah dimengerti, intonasi suara yang sangat jelas	Mahasiswa menyampaikan pendapat menggunakan bahasa yang baik, mudah dimengerti, intonasi suara yang jelas	Mahasiswa menyampaikan pendapat menggunakan bahasa yang cukup baik, cukup mudah dimengerti, intonasi suara yang cukup jelas	Mahasiswa menyampaikan pendapat menggunakan bahasa yang kurang baik, kurang mudah dimengerti, intonasi suara yang kurang jelas	Mahasiswa menyampaikan pendapat menggunakan bahasa yang tidak baik, tidak mudah dimengerti, intonasi suara yang tidak jelas
Parsitipasi aktif	Mahasiswa sangat aktif menyampaikan pendapat/masukannya, sangat aktif memberi jawaban, dan sangat berinisiatif mencari solusi	Mahasiswa aktif menyampaikan pendapat/masukannya, aktif memberi jawaban, dan berinisiatif mencari solusi	Mahasiswa cukup aktif menyampaikan pendapat/masukannya, cukup aktif memberi jawaban, dan cukup berinisiatif mencari solusi	Mahasiswa kurang aktif menyampaikan pendapat/masukannya, kurang aktif memberi jawaban, dan kurang berinisiatif mencari solusi	Mahasiswa tidak aktif menyampaikan pendapat/masukannya, tidak aktif memberi jawaban, dan tidak berinisiatif mencari solusi
Etika dan sikap tata nilai	Mahasiswa sangat mengindahkan etika diskusi akademik secara umum	Mahasiswa mengindahkan etika diskusi akademik secara umum	Mahasiswa cukup mengindahkan etika diskusi akademik secara umum	Mahasiswa kurang mengindahkan etika diskusi akademik secara umum	Mahasiswa tidak mengindahkan etika diskusi akademik secara umum
Kepemimpinan (diskusi kelompok)	Mahasiswa sangat mampu menginisiasi, menggerakkan, mengarahkan, mengorganisir jalannya diskusi	Mahasiswa mampu menginisiasi, menggerakkan, mengarahkan, mengorganisir jalannya diskusi	Mahasiswa cukup mampu menginisiasi, menggerakkan, mengarahkan, mengorganisir jalannya diskusi	Mahasiswa kurang mampu menginisiasi, menggerakkan, mengarahkan, mengorganisir jalannya diskusi	Mahasiswa tidak mampu menginisiasi, menggerakkan, mengarahkan, mengorganisir jalannya diskusi