COURSE PORTFOLIO

Study Program	:	MATHEMATICS - S1
Semester	:	ODD 2024/2025
Course Code	:	23H01120403
Course Name	:	Graph Theory
Coordinator	:	Prof. Dr. Hasmawati, M.Si.
Lecturer Team Member	:	Prof. Dr. Nurdin, S.Si., M.Si., Prof. Dr. Hasmawati, M.Si.

Implementation of Learning

Description of the implementation of the lecture, the suitability of what was planned in the RPS with what was done:

Number and percentage of lecturer and student attendance
(data source: monitoring the attendance of lecturers and students)

	Lecturer Attendance			Student Attendance
Graph Theory A	Prof. Dr. Hasmawati, M.Si. Prof. Dr. Nurdin, S.Si., M.Si. Total Meeting : 16 times.	: :	8 times 8 times	Number of students: 42 persons Presence ≥ 80% : 42 persons (100.00 %) Presence < 80% : 0 person (0.00 %)
Graph Theory B	Prof. Dr. Hasmawati, M.Si. Prof. Dr. Nurdin, S.Si., M.Si. Total Meeting : 16 times.	: :	8 times 8 times	Number of students: 37 persons Presence ≥ 80% : 37 persons (100.00 %) Presence < 80% : 0 person (0.00 %)

Materials/practicum provided

1. isomorphism, matrix graph, and enumeration (isomorphism, matrix graph, and enumeration)
2. Trees, Euler graphs, Hamilton graphs, planar graphs and connected tree graphs, Euler graphs, Hamilton graphs, planar graphs, and directed graph)
3. Connectivity
4. Matching and factorization (Matching and factorization)
5. Coloring graph and its applications(Coloring graph and it's application)
6. Fuzzy Coloring
7. Location Coloring

The learning methods implemented

Meeting 1

Lecture: Other methods lecture on systems lectures and evaluation 1x5

Lecture: Other methods reminds the material that have been studied in Discrete mathematics must be remembered and mastered as a basis in learning graph theory

Meeting 2

Lecture: Collaborative learning (Collaborative Learning)

3-4 Meetings

Lecture: Group discussion (Small Group Discussion) each group consists for 2 or 3 people

5 Meetings

Other Forms: Case Study (Case Study) constructing graphs

Meeting 6-7

Response and Tutorial: Collaborative learning (Collaborative Learning)

Meeting 8

UTS

Meeting 9

Response and Tutorial: Group discussion (Small Group Discussion) 4 or 5 people each group

10-11 Meeting

Lecture: Case Study (Case Study)

13-14 Meeting

Research, Design, or Development: Case Study (Case Study)

15-16 Meeting

Other Forms: Group discussion (Small Group Discussion)

The assessment method implemented

1. Project Report
2. Group task
3. Presentation
4. Short Q&A
5. Mid Test
6. Independent Assignment

Supplementary information (if available)

None

2. Learning Outcomes

Measurement results of CLO

Assessment and Evaluation of Student Achievement of CLO[a]

LOs that are charged to the Course	CLO	Assessment Form	Weight	Average student score (0-100)
KK1	CLO-1	Short Q&A	5.00 %	73.25
KK1	CLO-2	Short Q&A	5.00 %	73.25
KK1	CLO-2	Group task	10.00 %	73.25
KK1	CLO-2	Independent Assignment	15.00 %	73.25
KK3	CLO-3	Project Report	10.00 %	73.25
KK3	CLO-3	Mid Test	15.00 %	73.25
KK3	CLO-3	Presentation	15.00 %	73.25
KK3	CLO-3	Project Report	15.00 %	73.25
KK3	CLO-5	Group task	10.00 %	73.25
KK3	CLO-5	Independent Assignment	15.00 %	73.25
KU1	CLO-2	Independent Assignment	15.00 %	73.25
KU1	CLO-2	Group task	10.00 %	73.25
KU1	CLO-2	Short Q&A	5.00 %	73.25
KU1	CLO-4	Independent Assignment	15.00 %	73.25
KU1	CLO-4	Project Report	15.00 %	73.25
S2	CLO-3	Presentation	15.00 %	73.25
S2	CLO-3	Project Report	15.00 %	73.25
S2	CLO-3	Mid Test	15.00 %	73.25
S2	CLO-3	Project Report	10.00 %	73.25

a: result criteria: very satisfactory if the average score is ≥ 80; satisfactory if the average score is 70 - 79.9; unsatisfactory if the average score is < 70.

Percentage of students who achieved a very satisfactory CLO score [b]

(data source: student scores per assessment according to CLOs)

CLO	% of students who achieved a CLO score of at least 80
CLO-1	64.56%
CLO-2	64.56%
CLO-3	64.56%
CLO-4	64.56%
CLO-5	64.56%

b: result criteria: very satisfactory if ≥80% of students score ≥80; satisfactory if 70%-79.9% of students score ≥80; less satisfactory if < 70% of students score ≥80.

Course Grade

Course Grade	Number and Percentage of Students
A	32 (40.5%)
A-	19 (24.1%)
B+	9 (11.4%)
B	3 (3.8%)
B-	0 (0.0%)
C+	4 (5.1%)

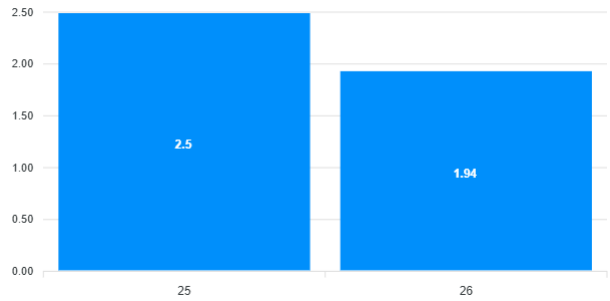
Course Grade	Number and Percentage of Students
C	1 (1.3%)
D	1 (1.3%)
E	10 (12.7%)

3. Learning evaluation (survey) results

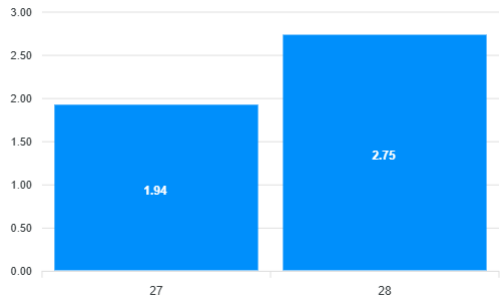
(data source: items / narratives of the results of the MK evaluation questionnaire by students)

Grafik Kuisioner Pembelajaran Matakuliah Teori Graf

Grafik Kuisioner Pembelajaran



Grafik Kuisioner Pembelajaran



Keterangan Nilai
Pertanyaan 1-24:

- 4 : Sangat Setuju/ Sangat Baik
- 3 : Setuju / Baik
- 2 : Ragu-ragu / Cukup
- 1 : Tidak Setuju / Kurang

Pertanyaan 25 dan 26: (WE = Waktu Efektif)

- 5 : WE > 200 menit
- 4 : 180 menit < WE <=200 menit
- 3 : 120 menit < WE <=180 menit
- 2 : 60 menit < WE <=120 menit
- 1 : 1WE <= 60 menit

Pertanyaan 27:

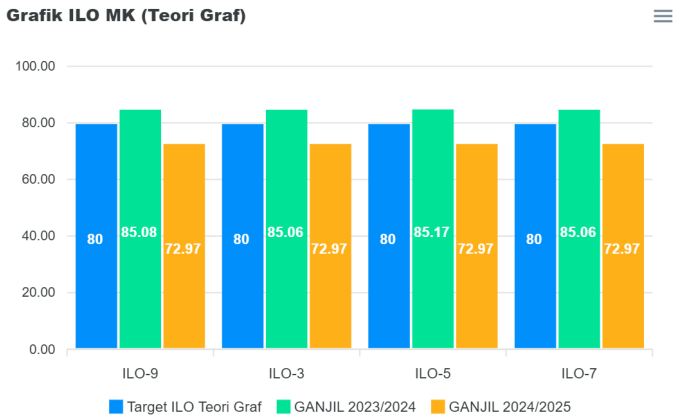
- 3 : Lebih Banyak
- 2 : Sama
- 1 : Lebih Sedikit

Pertanyaan 28:

- 3 : Sama
- 2 : Cukup Sesuai
- 1 : Kurang Sesuai

Informasi Pertanyaan Kuisioner

1. Dosen Menyampaikan Rancangan Pembelajaran Semester (RPS) dan Kontrak Perkuliahan di awal Perkuliahan dengan Jelas
2. Dosen Menjalankan Proses Pembelajaran yang berpusat pada mahasiswa (Student Centered Learning)
3. Dosen Menyiapkan materi Pemebelajaran dan sumber daya pensukung pwmbelajaran (diktat, slide, kasus, tugas, bahan ujian, dsb)
4. Dosen menjelaskan materi dengan baik dan jelas
5. Dosen memberikan materi setiap minggu sesuai dengan Rancangan Pembelajaran Semester (RPS) matakuliah
6. Dosen mempunyai kepedulian dan membantu mahasiswa dalam pemaham penguasaan suatu materi
7. Dosen Memberikan Penilaian dengan jelas dan sesuai dengn kontrak perkuliahan yang telah disepakati
8. Dosen memberikan umpan balik dengan memberikan komentar secara lengkap
9. Saya memahami materi kuliah setelah menyelesaikan perkuliahan ini
10. Matakuliah yang diberikan menstimulasi kemampuan intelektual saya
11. Tingkat kehadiran saya dalam matakuliah ini sangat tinggi (lebih dari 80% pertemuan)
12. Dosen menggunakan lebih dari satu metode penilaian (Assessment Metho
13. Jadwal matakuliah telah diinformasikan di SIM secara jelas sebelum perkuliahan dimulai
14. Dosen memberikan kuliah sesuai dengan jadwal kuliah yang telah ditetapkan
15. Dosen hadir tepat waktu sesuai dengan jadwal kuliah yang telah ditetapk
16. Dosen menyelesaikan perkuliahan tepat waktu sesuai dengan jadwal kuliah yang telah ditetapkan
17. Tersedia buku acuan/modul/ringkasan materi/slide matakuliah untuk semua materi yang diberikan
18. Buku acuan/modul/ringkasan materi/slide matakuliah yang diberikan berr dan uptodate dangan perkembangan yang ada
19. Selama Kualiah daring, fasilitas perkuliahan cukup memadai
20. Saya menggunakan SIKOLA sebagai wadah pembelajaran
21. Layanan Perpustakaan Prodi/Departemen/Fakultas/Universitas sangat me dalam proses pembelajaran
22. Beban sks matakuliah ini sudah sesuai dengan kompetensi yang akan dicapai (Catatan : 1 sks setara dngan 170 menit kegiatan belajar setiap pekan per semester)
23. Saya menggunakan SIKOLA sebagai wadah pembelajaran
24. Layanan Perpustakaan Prodi/Departemen,Universitas sangat membantu proses pembelajaran
25. Rata-rata Waktu Efektif (dalam menit) yang anda habiskan dalam seminggu (di luar jam perkuliahan)untuk menyelesaikan tugas terstrukturpada matakuliah ini
26. Rata-rata Waktu Efektif (dalam menit) yang anda habiskan dalam seminggu (di luar jam perkuliahan) unuk belajar mandiri pada matakuliah ini
27. Dibandingkan dengan matakuliah yang lainnya, jumlah waktu yang anda h khusus untuk matakuliah ini
28. Alokasi waktu yang digunakan untuk menyelesaikan tugas yang diberikan matakuliah ini



Hasil Pengukuran CPL MK Teori Graf

4. Analysis and Reflection

Analysis and Reflection

Analysis

1. Performance Collapse from Superior Level

Data analysis shows a very drastic collapse in overall performance. Subjects which in the EVEN 2023/2024 period showed very superior performance with all CPLs exceeding the target of 80 (average score 85), in the EVEN 2024/2025 period fell significantly, where all CPLs are now far below the target.

2. There is a Centralized Critical Failure Point

The decline that occurs is very uneven and concentrated in several specific areas. The most critical and fundamental failure occurred in CPL-3 and CPL-5, where both experienced a complete collapse, falling around 37 points from 85 to a very low level of 48. Meanwhile, other CPLs also declined, but not as badly as these two CPLs.

Reflection

1. Strong Indication of Specific Problems on Core Topics The failures centered on CPL-3 and CPL-5 reflect the high probability of very specific and fundamental problems related to the core topics or final assessments of this course. This is not just a general decline in the quality of teaching, but the possibility of drastic changes in materials, evaluation methods, or teaching lecturers which will have the most detrimental impact on the two CPLs.

2. Need for a Focused Emergency Investigation

Achievement levels below 50 are an emergency condition (red flag) that demands an immediate, highly focused investigation. The reflection is that follow-up cannot be general, but must prioritize a total audit of the learning and evaluation process that is directly related to CPL-3 and CPL-5. Understanding the root causes at these two points of failure is the key to saving and improving overall course performance.

5. Follow-up Plan

Strengthening Conceptual Basics

1. Providing special remedial or enrichment sessions at the beginning of the semester to review prerequisite material (Discrete Mathematics) so that students' foundations are stronger.
2. Creating brief modules or handouts containing basic concepts of graph theory (isomorphism, graph matrices, connectedness, etc.) that students can study independently.
3. Improving the Quality of Assignments Independent
4. Design independent assignments in the form of multilevel questions (from basic to application level) so that students do not immediately face difficult questions.
5. Provide guidance/examples of work at the beginning, then increase the level of independence gradually.
6. Provide structured feedback (feedback rubric) so students know where their mistakes are.
7. Assistance for Students with Low Grades
8. Identify students whose grades have been below C since the middle of the semester (for example through UTS results).
9. Form small study groups with peer tutoring or accompanying lecturers so that students receive special attention.

Variations in Learning Methods

1. Adding discussion portions and problem-based exercises (problem-based learning) to strengthen understanding of concepts.
2. Integrating technology (for example graph software such as Gephi, NetworkX Python) so that students can more easily understand real applications.
3. Periodic Evaluation and Monitoring
4. Conduct short quizzes at each meeting to monitor the development of students' basic understanding.
5. Conduct a mini survey in the middle of the semester so that lecturers can adjust learning methods if general difficulties are found.
6. Increased Student Motivation and Engagement
7. Relate graph theory topics to real cases (social networks, transportation, search algorithms) so that students feel the relevance of the material to the real world.

8. Provide more opportunities for small group presentations so that students are more active.

With this follow-up, it is hoped that:

1. Achievements of CPMK-1 and CPMK-2 will increase (better basic understanding).
2. Low grades (C and below) can be significantly reduced.
3. Students' learning independence develops so that independent assignment scores are no longer very low.

6. Follow-up results on the previous semester's evaluation

Follow-up Results of the Next Semester Evaluation

1. Enrichment sessions at the beginning of the semester were proven to help students re-understand the prerequisite material (Discrete Mathematics).
2. The average score of the initial *quiz* increased compared to the previous semester, and the number of students who had difficulty with basic concepts decreased.
3. Students were more active in working on assignments independently, although some still needed additional guidance.
4. Small study groups and *peer tutoring* are effective. Students who previously had the potential to fail (D/E grades) mostly succeeded in increasing their grades to at least C.
5. The number of students with E grades decreased drastically compared to the previous semester.
6. The integration of case studies based on real applications (for example graphs on transportation networks and social media) increases student enthusiasm.
7. The use of software (Gephi and NetworkX Python) makes it easier for students to understand the application of theory graph.
8. A short quiz at each meeting provides a quick overview of student progress, so that lecturers can adjust learning.
9. A mid-semester mini survey shows that the majority of students feel more helped by the new method.

General Reflection

- The follow-up carried out had a real positive impact on learning outcomes, especially in improving basic understanding and independent assignment results.
- Further improvements are still needed to improve **CPMK-2, CPMK-4, and CPMK-5**, which relate to advanced concept analysis and synthesis capabilities.
- It is necessary to further develop the *blended learning* model with online material (short learning videos, interactive exercises) so that students can be more flexible in repeating the material.

Makassar, 23 Oktober 2025

Prof. Dr. Hasmawati, M.Si.
NIP 196412311990032007