	Universitas Negeri Surabaya Faculty of Mathematics and Natural Sciences Doctoral Study Program in Mathematics Education	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Discrete Mathematics (Discrete Mathematics)	8400203043		T=3	P=0	ECTS=7.56	2	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Prof. Dr. Tatag Yuli Eko Siswono, S.Pd., M.Pd.

Learning model: Case Studies

Program Learning Outcomes (PLO)

PLO study program that is charged to the course

Program Objectives (PO)

PLO-PO Matrix

P.O

PO Matrix at the end of each learning stage (Sub-PO)

P.O	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Short Course Description: Study of discrete mathematics concepts, especially discussing discrete dynamic systems, algorithms, combinatorics, and graph theory with emphasis on algorithm complexity, existence and optimization problems in graph theory and its algorithms. Lectures begin with an explanation of concepts and principles, assignments and discussions with students, as well as presentations using ICT with an assessment system including assignments (30%), participation (20%), mid-semester assessment (20%) and final semester assessment (30%).

References

Main :

1. Budayasa, K.. 2008. Matematika Diskrit . Surabaya: University Press Unesa.
2. Budayasa, K.. 2008. Teori graph dan aplikasinya . Surabaya: University Press Unesa.
3. Bollobas, B.. 2002. Modern graph theory, corrected Ed . Berlin: Springer Verlag
4. Chartrand, G. & Lesniak, L.. 1996. Graphs and digraphs .London: Chapman Hall/CRC.
5. Chen, W. K.. 2003. Net Theory and its applications-flows in Networks . London: Imperial College Press.
6. Diestel, R.. 2010. Graph theory . Springer Verlag.
7. Harary, F. & Palmer, E. M.. 1973. Graphical enumeration . New York: Academic Press, Inc.
8. Gross, J. L., & Yellen, J.. 2005. Graph theory and its applications . CRC Press.
9. Tucker, A.. 2012. Applied combinatorics. New York: John Wiley & Sons, Inc.
10. Wilf, H. S.. 1994. Generating functionology .London: Academic Press, Inc.

Supporters:

Supporting lecturer: Prof. Drs. I Ketut Budayasa, Ph.D.

Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)
		Indicator	Criteria & Form	Offline (*offline*)	Online (*online*)		

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Sub CPMK-1.1 Able to describe general discrete concepts.	Describe the general concept of discrete.		Assignments, Lectures, Presentations and Discussions 3 X 50			0%
2	Sub CPMK-2.1 Able to analyze basic graph concepts.	Analyzing basic graph concepts.		Assignments, Lectures, Presentations and Discussions 3 X 50			0%
3	Sub CPMK-2.1 Able to analyze basic graph concepts.	Analyze the shortest path problem.		Assignments, Lectures, Presentations and Discussions 3 X 50			0%
4	Sub CPMK-2.1 Able to analyze basic graph concepts.	Analyzing the concept of Euler graphs and algorithms		Assignments, Lectures, Presentations and Discussions 3 X 50			0%
5	Sub CPMK-3.1 Able to analyze advanced graph concepts.	Analyzing the concept of a directed Euler Graph.		Assignments, Lectures, Presentations and Discussions 3 X 50			0%
6	Sub CPMK-3.1 Able to analyze advanced graph concepts.	Analyzing the concept of matching graphs.		Assignments, Lectures, Presentations and Discussions 3 X 50			0%
7	Sub CPMK-3.2 Able to apply advanced graph concepts.	Analyze tournaments and traffic flows.		Assignments, Lectures, Presentations and Discussions 3 X 50			0%
8	Midterm exam	Midterm exam		3 X 50			0%
9	Sub CPMK-3.2 Able to apply advanced graph concepts.	Apply network and breaker concepts.		Assignments, Lectures, Presentations and Discussions 3 X 50			0%
10	Sub CPMK-3.2 Able to apply advanced graph concepts.	Applying the concept of maximum flow to the network.		Assignments, Lectures, Presentations and Discussions 3 X 50			0%
11	Sub CPMK-3.2 Able to apply advanced graph concepts.	Applying the closing point number to the graph.		Assignments, Lectures, Presentations and Discussions 3 X 50			0%
12	Sub CPMK-3.2 Able to apply advanced graph concepts.	Applying the closing point number to the graph.		Assignments, Lectures, Presentations and Discussions 3 X 50			0%
13	Sub CPMK-3.2 Able to apply advanced graph concepts.	Applying f-factors to graphs.		Assignments, Lectures, Presentations and Discussions 3 X 50			0%

14	Sub CPMK-3.2 Able to apply advanced graph concepts.	Applying matching to the graph.		Assignments, Lectures, Presentations and Discussions 3 X 50			0%
15	UAS	UAS		3 X 50			0%
16							0%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
		0%

Notes

1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
5. **Indicators for assessing** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.