



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Mathematics Department

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Undergraduate Programme in Mathematics

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MODULE HANDBOOK

Module name	Introduction to Graph Theory												
Module level, if applicable	Bachelor												
Code, if applicable	MMM-2206												
Subtitle, if applicable	-												
Courses, if applicable	Introduction to Graph Theory												
Semester(s) in which the module is taught	4 th (fourth)												
Person responsible for the module	Chair of the Lab. of Algebra												
Lecturer(s)	Dr. rer.nat. Indah Emilia, M.Si. Dr. rer. nat. Yeni Susanti, M.Si. Dr. Budi Surodjo, M.S.												
Language	Bahasa Indonesia												
Relation to curriculum	Bachelor Degree, Elective Course, 4 th semester												
Type of teaching, contact hours	150 minutes lectures, 180 minutes structured activities.												
Workload	Total workload is 136 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 180 minutes structured activities per week, 180 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.												
Credit points	3												
Requirements according to the examination regulations	Students have taken Introduction to Graph Theory course (MMM-2206) and have an examination card where the course is stated on.												
Recommended prerequisites	Students have taken Discrete Mathematics II course (MMM-2207) and have participated in the final examination of the course.												
Module objectives/intended learning outcomes	After completing this course the students should have : CO 1. ability to prove some properties of graph. CO 2. ability in problem solving skill using procedure in graph theory CO 3. ability to apply graph theory in simple mathematical modelling												
Content	Basic concept of graph theory, Simple Graph, Multiple Graph, Isomorphic Graph, Types of Graph, Complement of Graph, Planar Graph, Euler Formula, Subgraph, Connected Graph, Path, Trail, Circuit, Cut sets, Bridge of Konigsberg, Eulerian Graph, Eulerian Trail, Hamiltonian Graph, Tree, Minimum spanning tree, Kruskal Algorithm, Prime Algorithm, Planarity and Duality, Coloring of Graph, Directed Graph, Pruning Algorithm, Matrix and Graphs/Digraphs, PERTH-Graph and Shortest Distance Tree.												
Study and examination requirements and forms of examination	The final mark will be weighted as follows: <table border="1"> <thead> <tr> <th>No</th> <th>Assessment methods (components, activities)</th> <th>Weight (percentage)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final Examination</td> <td>40%</td> </tr> <tr> <td>2</td> <td>Mid-Term Examination</td> <td>30%</td> </tr> <tr> <td>3</td> <td>Class Activities: Quiz, Homework, etc.</td> <td>30%</td> </tr> </tbody> </table> The initial cut-off points for grades A, B, C, and D should not be less than 80%, 70%, 50%, and 40%, respectively.	No	Assessment methods (components, activities)	Weight (percentage)	1	Final Examination	40%	2	Mid-Term Examination	30%	3	Class Activities: Quiz, Homework, etc.	30%
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1	Final Examination	40%											
2	Mid-Term Examination	30%											
3	Class Activities: Quiz, Homework, etc.	30%											
Media employed	Projector, Board												
Reading List	<ol style="list-style-type: none"> Gary Chartrand G., Ping Zhang, 2012, <i>A First Course in Graph Theory</i>, Dover Publications Ronald Gould, 2012, <i>Graph Theory</i>, Dover Publications Joan M. Aldous, Robin J. Wilson, 2000, <i>Graph and Applications: An Introductory Approach</i>, Springer, London. 												

	4. B. Andrasfai, 1977, <i>Introductory Graf Theory</i> , Acade'miai Kiado', Budapest 5. Seymour Lipschutz, 1976; <i>Theory and Problems of Discrete Mathematics; Schaum's Outline Series</i> ; McGraw-Hill Book Company. 6. Robin J. Wilson, 1972; <i>Introduction to Graph Theory</i> , Longman Group Limited.
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PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
CO 1			v		v	v	v		v
CO 2		v			v				
CO 3					v				