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Master in Mathematics

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MODULE HANDBOOK

Module Name	Graph Theory and Combinatorics
Module level, if applicable	Master Programme
Code, if applicable	MMM 5215
Subtitle, if applicable	-
Courses, if applicable	Graph Theory and Combinatorics
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Chair of the Algebra Laboratory
Lecturer(s)	1. Dr. Al. Sutjijana, M.Sc. 2. Dr.rer.nat. Yeni Susanti, M.Si. 3. Uha Isnaini, M.Sc., Ph.D.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory in Algebra Interest
Teaching methods	lecture, project based
Workload (incl. contact hours, self-study hours)	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
Required and recommended prerequisites for joining the module	Students should have basic knowledge on sets, logics and the main principles in discrete mathematics (counting principle, mathematical induction, pigeonhole principle, and inclusion exclusion principle)

Module objectives/intended learning outcomes	On successful completion of this course, students should be able to: CO 1. prove some properties of graph CO 2. Prove some properties of finite field, finite geometry and latin square CO 3. solve problems related to graphs and combinatorics CO 4. make a development or a generalization or combine properties related to graph and combinatorics
Content	The study material for graph theory and combinatorics can be divided into 2 parts: A. Graph Theory Definition and example of graph, degree, adjacency, incidence, handshaking lemma, subgraph, induced subgraphs, graph isomorphism, regular graph, bipartite graph, special graphs, operation of graphs, graph connectivity, tree, planarity, coloring, matching. B. Combinatorics Finite field, finite geometry, projective geometry, Latin square, MOLS, BIBD, algorithm, complexity of algorithm
Examination forms	oral presentation, writing project, written exam (for mid exam and final exam), project presentation
Study and examination requirements	The final mark will be weighted as follows: No Assessment methods (components, activities) — Weight (percentage) 1 Final Examination — 25% 2 Mid-Term Examination — 25% 3. Project — 50% To pass the course, the minimum grade is C (50%)
Media employed	Board, LMS eLOK UGM, Course Material

Reading list	1. Dougherty, S.T., 2020, Combinatorics and Finite Geometry, Springer International Publishing 2. Robin J. Wilson, 1998, Introduction to Graph Theory, Fourth Edition, Addison Wesley Longman 3. Bose, R.C., Manvel, B., 1983, Introduction to Combinatorial Theory, Colorado State University, John Wiley and Sons 4. Van Lint, J.H., Wilson, R.M., 1992, A Course in Combinatorics, Cambridge university Press 5. Reinhard Diestel, 2005, Graph Theory, Springer Verlag Heidelberg New York 6. Rosen, K.H., 2011, Discrete Mathematics and Its Applications, Seventh Edition, Mc-Graw Hill Education

CO-PLO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6
CO 1		v	v		v	
CO 2		v	v		v	
CO 3		v	v		v	
CO 4			v		v	

Compilation Date : July 25, 2022

Modified Date :