



UNIVERSITAS GADJAH MADA
Faculty of Mathematics and Natural Sciences
Department of Mathematics

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Master in Mathematics

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MODULE HANDBOOK

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| Module Name | Algebraic Graph Theory |
| Module level, if applicable | Master Programme |
| Code, if applicable | MMM 6209 |
| Subtitle, if applicable | - |
| Courses, if applicable | Algebraic Graph Theory |
| Semester(s) in which the module is taught | |
| 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 | Elective Course |
| 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 elementary linear algebra, graph theory and group theory |

| Module objectives/intended learning outcomes | <p>On successful completion of this course, students should be able to:</p> <p>CO 1. prove some properties of algebraic graph</p> <p>CO 2. give argumentation related to the properties of algebraic graph</p> <p>CO 3. make a connection between graph theory and algebra</p> | | | | | | | | | | | | |
|--|--|---------------------|--|---------------------|---|-------------------|-----|---|----------------------|-----|----|---------|-----|
| Content | <p>This course covers topic in graph theory and the connection with algebra, particularly linear algebra and group theory.</p> <p>Content in detail: review on graph concept, adjacency matrix and incidence matrix and the properties, circulant graph; Johnson graph; regular graph, line graph, eigen value of graph, eigen value of some particular graphs, Cayley graph, Cayley graph of symmetric group, graph automorphism; transitivity of graphs (vertex transitive, edge transitive, distance transitive, retract; incidence graph, core</p> | | | | | | | | | | | | |
| Examination forms | oral presentation, writing project, written exam (for mid exam and final exam), project presentation | | | | | | | | | | | | |
| Study and examination requirements | <p>The final mark will be weighted as follows:</p> <table border="1" data-bbox="625 884 1404 1102"> <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>25%</td> </tr> <tr> <td>2</td> <td>Mid-Term Examination</td> <td>25%</td> </tr> <tr> <td>3.</td> <td>Project</td> <td>50%</td> </tr> </tbody> </table> <p>To pass the course, the minimum grade is C (50%)</p> | No | Assessment methods (components, activities) | Weight (percentage) | 1 | Final Examination | 25% | 2 | Mid-Term Examination | 25% | 3. | Project | 50% |
| No | Assessment methods (components, activities) | Weight (percentage) | | | | | | | | | | | |
| 1 | Final Examination | 25% | | | | | | | | | | | |
| 2 | Mid-Term Examination | 25% | | | | | | | | | | | |
| 3. | Project | 50% | | | | | | | | | | | |
| Media employed | Board, LMS eLOK UGM, Course Material | | | | | | | | | | | | |
| Reading list | <ol style="list-style-type: none"> 1. Ravindra B. Bapat, 2010, Graphs and Matrices, Springer 2. Chris Godsil and Gordon Royle, 2001, Algebraic Graph Theory, Springer 3. Norman Biggs, 1996, Algebraic Graph Theory, Cambridge University Press 4. Ulrich Knauer, 2011, Algebraic Graph Theory, De Gruyter 5. Lowell W. Beineke, Jay S. Bagga, 2021, Line Graphs and Line Digraphs, Springer 6. D.S. Malik. John M. Mordeson, M. K. Sen, 1996, Fundamentals of Abstract Algebra, McGraw-Hill College 7. Howard Anton and Chris Rorres, 2013, Elementary Linear Algebra : Applications Version, 11th Edition, John Wiley and Sons. | | | | | | | | | | | | |

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 | | v | v |

Compilation Date : August 8, 2022

Modified Date :