

**MODULE HANDBOOK**  
**Master Program in Computer Science**  
**Department of Computer Science and Electronics**  
**Faculty of Mathematics and Natural Sciences**  
**Universitas Gadjah Mada**

**Database Management System**

Module name	<b>Database Management System</b>																							
Module level	Master																							
Code	MII-6033																							
Courses (if applicable)																								
Semester	Odd (Ganjil)																							
Contact person	Dr. Khabib Mustofa, M.Kom.																							
Lecturer	Dr. Khabib Mustofa, M.Kom.																							
Language	Bahasa Indonesia																							
Relation to curriculum	Master program, elective, 3 <sup>rd</sup> semester																							
Type of teaching, contact hours	Master program: lectures, 13 student, Wednesday, 10.00 - 12.30.																							
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Exercises and Assignments: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.																							
Credit points	3 credit points (sks).																							
Requirements according to the examination regulations	-																							
Recommended prerequisites	-																							
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to: <table border="1" style="margin-left: 20px;"> <tr> <td>CO-01</td> <td>be able to explain the importance of the database in information management</td> <td>PLO-1, PLO-8</td> </tr> <tr> <td>CO-02</td> <td>be able to explain data models (spreadsheets, relational, objects, semi-structured, graphs, text, distributed databases) and their characteristics</td> <td>PLO-5, PLO-8</td> </tr> <tr> <td>CO-03</td> <td>be able to do modeling or formulation of real problems into the appropriate database model</td> <td>PLO-4, PLO-5, PLO-7</td> </tr> <tr> <td>CO-04</td> <td>be able to explain the concept of relational algebra as the basic theory of operations in a relational database</td> <td>PLO-8</td> </tr> <tr> <td>CO-05</td> <td>be able to use query languages (SQL, NoSQL, graph-based queries, SPARQL)</td> <td>PLO-4, PLO-5, PLO-7</td> </tr> <tr> <td>CO-06</td> <td>be able to implement database optimization mechanisms: indexing, normalization, transactions.</td> <td>PLO-6, PLO-7</td> </tr> <tr> <td>CO-07</td> <td>be able to explain the latest technology related to electronic data management</td> <td>PLO-6, PLO-8</td> </tr> </table>			CO-01	be able to explain the importance of the database in information management	PLO-1, PLO-8	CO-02	be able to explain data models (spreadsheets, relational, objects, semi-structured, graphs, text, distributed databases) and their characteristics	PLO-5, PLO-8	CO-03	be able to do modeling or formulation of real problems into the appropriate database model	PLO-4, PLO-5, PLO-7	CO-04	be able to explain the concept of relational algebra as the basic theory of operations in a relational database	PLO-8	CO-05	be able to use query languages (SQL, NoSQL, graph-based queries, SPARQL)	PLO-4, PLO-5, PLO-7	CO-06	be able to implement database optimization mechanisms: indexing, normalization, transactions.	PLO-6, PLO-7	CO-07	be able to explain the latest technology related to electronic data management	PLO-6, PLO-8
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Content	The Database Management System Course is a compulsory course with the aim of providing students knowledge about matters relating to electronic data management and the latest technology related to it. The knowledge gained is expected not only from the conceptual side but also in implementation in the field. The topics that will be discussed in the Database Management System course include an overview of the database in the management of data and information, data models ( <i>relational, semi-structured, graph, text, distributed</i> ), procedural query language ( <i>Relational Algebra</i> ), language non-procedural queries (SQL, SPARQL, XQuery, Cypher), functional dependencies, closures, normalization, indexing, transaction handling ( <i>concurrency, rollback, commit</i> ), data-warehouse.
Study and examination requirements and forms of examination	Mid-terms examination and Final examination.
Media employed	LCD, blackboard, websites, and e-learning.
Assessments and Evaluation	<p><b>CO1:</b> Assignment/Excercise (5%)</p> <p><b>CO2:</b> Problem 1 (5%) in Mid-term, Problem 1 (7.5%) and Problem 2 (7.5%) in Final exam, Assignment/Exercise (5%)</p> <p><b>CO3:</b> Problem 2 (5%) in Mid-term, Problem 3 (7.5%) in Final exam, exercise/quiz (2.5%)</p> <p><b>CO4:</b> Problem 3 (5%) in Mid-term, assignment/quiz (5%)</p> <p><b>CO5:</b> Problem 4 (7.5%) in Mid-term, Problem 4 (7.5%) in Final exam, assignment (7.5%)</p> <p><b>CO6:</b> Problem 5 (5%) in Mid-term, Problem 5 (7.5%) in Final exam, assignment (5%)</p> <p><b>CO7:</b> Problem 6 (5%) in Final exam</p>
Reading List	<p>Silberschatz, A., Korth, H.F. and Sudarshan, <i>Database System Concepts</i>, 6th Edition, McGraw-Hill, 2010.</p> <p>Ramakrishnan, R. and Gehrke, J., <i>Database Management Systems</i>, 3rd Edition, McGraw-Hill, 2003</p> <p>Robinson, I., Webber, J., &amp; Eifrem, E., <i>Graph databases</i>. O'Reilly Media, Inc., 2013.</p> <p>Strauch, C, <i>NoSQL Databases</i>, Stuttgart Univ.</p>