



**UNIVERSITAS GADJAH MADA**  
**Faculty of Mathematics and Natural Sciences**  
**Department of Computer Science and Electronics**  
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## Doctoral Programme of Computer Science

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Module name: **ADVANCE DATABASE SYSTEM**

Module level, if applicable: **DOCTORAL**

Code, if applicable: MII7540

Semester(s) in which the module is taught: 1 (Odd)

Person responsible for the module: Yunita Sari, M.Sc., Ph.D

Lecturer(s): Yunita Sari, M.Sc., Ph.D

Language: Bahasa Indonesia

Relation to curriculum: Elective course

Credit points: 3

Type of teaching, contact hours: A mixed of Classical delivery, literature study, mini project, and presentation

Workload: 6-9 hours/week (meeting, literature study, and project)

Requirements according to the examination regulations: Mini project presentation and report. The report may be in the paper format.

Recommended prerequisite: Good in fundamental database system

Module objectives/ intended learning outcomes:  
CO1: students will be able to design, develop and implement a mid-scale relational database for an application domain using a commercial-grade RDBMS.  
CO2: students will be able to identify and resolve physical database design and implementation issues.  
CO3: students will be able to use the persistence framework of a chosen language to perform Object Relational Mapping.  
CO4: students will be able to do research, analyze and use emerging technologies such as Big Data, NoSQL, On-Line Analytical Processing (OLAP) and Data Warehouses.  
CO5: Have hands-on experience with several contemporary information management systems.  
(CO-6). Explore a research aspect of advanced databases

Content:  
1) DBMS Internals (Storage and Indexing, Query Processing and Optimization, Concurrency Control, and Crash Recovery)  
2) Physical Database Design and implementation issues  
3) Object Relational Mapping (ORM)

	<ul style="list-style-type: none"> <li>) Big Data and Parallel and Distributed database (topics such as role of NoSQL, Map-reduce, Hadoop platform etc.)</li> <li>) Contemporary issues and emerging technologies such as On-Line Analytical Processing (OLAP), Data Warehouses, database-as-a-service (DB clouds)</li> </ul>
Study and examination requirements and forms of examination:	Students are evaluated based on mini project presentation and report
Media employed:	Face to face meeting, online meeting, power point presentation
Reading List:	<ol style="list-style-type: none"> <li>1. Ling Liu and Tamer M. Özsu (Eds.) (2009). "Encyclopedia of Database Systems, 4100 p. 60 illus. ISBN 978-0-387-49616-0.</li> <li>2. Beynon-Davies, P. (2004). Database Systems. 3rd Edition. Palgrave, Houndmills, Basingstoke.</li> <li>3. Connolly, Thomas and Carolyn Begg. Database Systems. New York: Harlow, 2002.</li> <li>4. Date, C. J. (2003). An Introduction to Database Systems, Fifth Edition. Addison Wesley. ISBN 0-201-51381-1.</li> <li>5. Gray, J. and Reuter, A. Transaction Processing: Concepts and Techniques, 1st edition, Morgan Kaufmann Publishers, 1992.</li> <li>6. Kroenke, David M. and David J. Auer. Database Concepts. 3rd ed. New York: Prentice, 2007.</li> <li>7. Lightstone, S.; Teorey, T.; Nadeau, T. (2007). Physical Database Design: the database professional's guide to exploiting indexes, views, storage, and more. Morgan Kaufmann Press. ISBN 0-12-369389-6.</li> <li>8. Teorey, T.; Lightstone, S. and Nadeau, T. Database Modeling &amp; Design: Logical Design, 4th edition, Morgan Kaufmann Press, 2005. ISBN 0-12-685352-5</li> </ol>

#### The Mapping of COs to PLOs

COs	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CO-1							√	√
CO-2					√	√		
CO-3					√	√		
CO-4						√	√	
CO-5					√	√		
CO-6						√	√	

The PLO of DP-CS

<b>PLO</b>	<b>Knowledge Area</b>	<b>PLO Description</b>
<b>PLO1</b>	[Values and principles]	A graduate should be devoted to God Almighty, uphold the humanity values, internalize academic values and ethics, responsible in working around expertise independently.
<b>Managerial Capability</b>		
<b>PLO2</b>	[Professional attitudes]	A graduate should have good interpersonal skills; able to work together within the organization, both as a leader and a member; able to be the initiator; able to manage and delegate tasks; and have a sense of responsibility for their own work as well as take responsibility for the achievement of the organization's work.
<b>PLO3</b>	[Communication skills]	A graduate should be able to communicate effectively and efficiently with stakeholders from various backgrounds; use English well; and able to write and present scientific papers correctly and well.
<b>PLO4</b>	[Life-long learning]	A graduate should be up to date with the state-of-the-art especially in computer science field, able to take parts in the development of computer science field that is engaged in and relate it to other fields throughout life.
<b>Working Capability</b>		
<b>PLO5</b>	[Problem-solving and Scientific skills]	A graduate should be able to analyse science and technology problems in the computer science field, develop alternative solutions through intra disciplinary, interdisciplinary, and trans disciplinary approaches to produce innovative, original, and tested works.
<b>PLO6</b>	[Ability to formulate and do research]	A graduate should be able to formulate research problems through critical, exploratory, and innovative studies both independently and in groups of computer science field that is engaged in and present research results in a scientific paper at regional or international level.
<b>Mastering Knowledge</b>		
<b>PLO7</b>	[Fundamental knowledge]	A graduate should be able to develop knowledge in the field of computer science that is engaged, which includes abstraction, complexity, evolution and philosophy of changes or developments in the field of science.
<b>PLO8</b>	[Applied knowledge]	A graduate should be able to develop theoretical, philosophical, and applied concepts in the field of computer science that is engaged in, and to represent them in a structured and systematic manner.