



Universitas Negeri Surabaya
Faculty of Engineering,
Electrical Engineering Masters Study Program

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																																			
Advanced Database Systems	2010102032		T=2	P=0	ECTS=4.48	2	July 17, 2024																																																			
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator																																																				
	Prof. Dr. I.G.P. Asto Buditjahjanto, S.T.,M.T.				Unit Three Kartini, S.T., M.T., Ph.D.																																																				
Learning model	Case Studies																																																									
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																																									
	Program Objectives (PO)																																																									
	PO - 1	Students can explain the concepts of relational and non-relational databases and are able to manage database users, roles and privileges																																																								
	PLO-PO Matrix																																																									
		<table border="1" style="margin: auto;"> <tr><td style="text-align: center;">P.O</td></tr> <tr><td style="text-align: center;">PO-1</td></tr> </table>						P.O	PO-1																																																	
	P.O																																																									
PO-1																																																										
PO Matrix at the end of each learning stage (Sub-PO)																																																										
	<table border="1" style="margin: auto;"> <tr> <td style="text-align: center;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td></td> <td style="text-align: center;">1</td><td style="text-align: center;">2</td><td style="text-align: center;">3</td><td style="text-align: center;">4</td><td style="text-align: center;">5</td><td style="text-align: center;">6</td><td style="text-align: center;">7</td><td style="text-align: center;">8</td><td style="text-align: center;">9</td><td style="text-align: center;">10</td><td style="text-align: center;">11</td><td style="text-align: center;">12</td><td style="text-align: center;">13</td><td style="text-align: center;">14</td><td style="text-align: center;">15</td><td style="text-align: center;">16</td> </tr> <tr> <td style="text-align: center;">PO-1</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>						P.O	Week																	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	PO-1																	
P.O	Week																																																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																																										
PO-1																																																										
Short Course Description	In this course students learn about: (1) relational and non-relational database concepts; (2) differences between relational and non-relational databases; (3) concept and application of relational algebra operations to simple relations; (4) basic concepts in special purpose databases including online analytical processing, data warehouse, and data mining; (5) database administration concept; (6) database administrator duties; (7) the concept of database security, back up and recovery; and (8) able to manage database users, roles and privileges																																																									
References	Main :																																																									
	1. Database Management Systems 3rd edition, by Raghu Ramakrishnan and Johannes Gehrke. ISBN: 978-0072465631, McGraw-Hill, 2002. 2. Database Systems: The Complete Book 2nd edition, by Hector Garcia-Molina, Jeff Ullman and Jennifer Widom. ISBN: 978-0131873254, Prentice Hall, 2008																																																									
	Supporters:																																																									
Supporting lecturer	Prof. Dr. I Gusti Putu Asto Buditjahjanto, S.T., M.T.																																																									
Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)																																																			
		Indicator	Criteria & Form	Offline (offline)	Online (online)																																																					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)																																																			

1	1. Students are able to explain relational databases	<p>1.1. Students are able to explain Database Design</p> <p>2.2. Students are able to explain Database Design and ER Diagrams</p> <p>3.3. Students are able to explain Entities, Attributes and Entity Collections</p> <p>4.4. Students are able to explain relationships and sets of relationships</p> <p>5.5. Students are able to explain additional features of the ER model</p> <p>6.6. Students are able to explain Conceptual Design Using the ER Model</p> <p>7.7. Students are able to explain Conceptual Design for Large Companies</p> <p>8.8. Students are able to explain the Integrated Modeling Language</p> <p>9.9. Students are able to explain Case Study: Internet Shop</p>	<p>Criteria: - Students can explain relational databases well</p> <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Lectures, Discussions and Presentations 2x50"		<p>Material: • Relational databases Library: <i>Database Management Systems 3rd edition, by Raghu Ramakrishnan and Johannes Gehrke. ISBN: 978-0072465631, McGraw-Hill, 2002.</i></p>	5%
---	--	--	---	---	--	--	----

2	1. Students are able to explain relational databases	<p>1.1. Students are able to explain Database Design</p> <p>2.2. Students are able to explain Database Design and ER Diagrams</p> <p>3.3. Students are able to explain Entities, Attributes and Entity Collections</p> <p>4.4. Students are able to explain relationships and sets of relationships</p> <p>5.5. Students are able to explain additional features of the ER model</p> <p>6.6. Students are able to explain Conceptual Design Using the ER Model</p> <p>7.7. Students are able to explain Conceptual Design for Large Companies</p> <p>8.8. Students are able to explain the Integrated Modeling Language</p> <p>9.9. Students are able to explain Case Study: Internet Shop</p>	<p>Criteria: - Students can explain relational databases well</p> <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Lectures, Discussions and Presentations 2x50"		<p>Material: • Relational databases Library: <i>Database Management Systems 3rd edition, by Raghu Ramakrishnan and Johannes Gehrke. ISBN: 978-0072465631, McGraw-Hill, 2002.</i></p>	5%
---	--	--	---	---	--	--	----

3	1. Students are able to explain relational databases	<p>1.1. Students are able to explain Database Design</p> <p>2.2. Students are able to explain Database Design and ER Diagrams</p> <p>3.3. Students are able to explain Entities, Attributes and Entity Collections</p> <p>4.4. Students are able to explain relationships and sets of relationships</p> <p>5.5. Students are able to explain additional features of the ER model</p> <p>6.6. Students are able to explain Conceptual Design Using the ER Model</p> <p>7.7. Students are able to explain Conceptual Design for Large Companies</p> <p>8.8. Students are able to explain the Integrated Modeling Language</p> <p>9.9. Students are able to explain Case Study: Internet Shop</p>	<p>Criteria: - Students can explain relational databases well</p> <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Lectures, Discussions and Presentations 2x50"		<p>Material: • Relational databases Library: <i>Database Management Systems 3rd edition, by Raghu Ramakrishnan and Johannes Gehrke. ISBN: 978-0072465631, McGraw-Hill, 2002.</i></p>	5%
4	1. Students are able to explain Relational Models	<p>1.1. Students are able to explain the Obstacles to Integrity in Relationships</p> <p>2.2. Students are able to explain Integrity Obstacles</p> <p>3.3. Students are able to explain Compiling Relational Data</p> <p>4.4. Students are able to explain Logical Database Design: ER to Relational. Students are able to create displays</p> <p>5.5. Students are able to change tables and displays</p>	<p>Criteria: - Students can explain Relational Models well</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Lectures, Discussions and Presentations 2x 50"		<p>Material: • Relational Models Library: <i>Database Management Systems 3rd edition, by Raghu Ramakrishnan and Johannes Gehrke. ISBN: 978-0072465631, McGraw-Hill, 2002.</i></p>	5%

5	1. Students are able to explain Relational Models	<p>1.1. Students are able to explain the Obstacles to Integrity in Relationships</p> <p>2.2. Students are able to explain Integrity Obstacles</p> <p>3.3. Students are able to explain Compiling Relational Data</p> <p>4.4. Students are able to explain Logical Database Design: ER to Relational. Students are able to create displays</p> <p>5.5. Students are able to change tables and displays</p>	<p>Criteria: - Students can explain Relational Models well</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Lectures, Discussions and Presentations 2x 50"		<p>Material: • Relational Models Library: Database Management Systems 3rd edition, by Raghu Ramakrishnan and Johannes Gehrke. ISBN: 978-0072465631, McGraw-Hill, 2002.</p>	5%
6	1. Students are able to explain relational algebra	<p>1.1. Students are able to explain Relational Calculus</p> <p>2.2. Students are able to explain the Expressive Power of Algebra and Calculus</p>	<p>Criteria: - Students can explain Relational algebra well</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Lectures, Discussions and Presentations 2x 50"		<p>Material: • Relational relation algebra Library: Database Management Systems 3rd edition, by Raghu Ramakrishnan and Johannes Gehrke. ISBN: 978-0072465631, McGraw-Hill, 2002.</p>	5%
7	1. Students are able to explain relational algebra	<p>1.1. Students are able to explain Relational Calculus</p> <p>2.2. Students are able to explain the Expressive Power of Algebra and Calculus</p>	<p>Criteria: - Students can explain Relational algebra well</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Lectures, Discussions and Presentations 2x 50"		<p>Material: • Relational relation algebra Library: Database Management Systems 3rd edition, by Raghu Ramakrishnan and Johannes Gehrke. ISBN: 978-0072465631, McGraw-Hill, 2002.</p>	5%
8	UTS	- Students can explain meetings 1-7 well	<p>Criteria: - Students can explain meetings 1-7 well</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Demo and simulation 2x 50"		<p>Material: • Meetings 1-7 Bibliography: Database Management Systems 3rd edition, by Raghu Ramakrishnan and Johannes Gehrke. ISBN: 978-0072465631, McGraw-Hill, 2002.</p>	15%

9	1. Students are able to explain Basic SQL Query Forms	1.1. Students are able to explain UNION, INTERSECT, and EXCEPT 2.2. Students are able to explain Nested Queries 3.3. Students are able to explain Aggregate Operators 4.4. Students are able to explain the Null Value 5.5. Students are able to explain Complex Integrity Constraints in SQL 6.6. Students are able to explain Triggers and Active Databases 7.7. Students are able to explain Designing an Active Database	Criteria: - Students can explain SQL Query Forms well Form of Assessment : Project Results Assessment / Product Assessment	Lectures, Discussions and Presentations 2x 50"		Material: • SQL Query Forms Library: <i>Database Systems: The Complete Book 2nd edition, by Hector Garcia-Molina, Jeff Ullman and Jennifer Widom. ISBN: 978-0131873254, Prentice Hall, 2008</i>	5%
10	1. Students are able to explain Basic SQL Query Forms	1.1. Students are able to explain UNION, INTERSECT, and EXCEPT 2.2. Students are able to explain Nested Queries 3.3. Students are able to explain Aggregate Operators 4.4. Students are able to explain the Null Value 5.5. Students are able to explain Complex Integrity Constraints in SQL 6.6. Students are able to explain Triggers and Active Databases 7.7. Students are able to explain Designing an Active Database	Criteria: - Students can explain SQL Query Forms well Form of Assessment : Project Results Assessment / Product Assessment	Lectures, Discussions and Presentations 2x 50"		Material: • SQL Query Forms Library: <i>Database Systems: The Complete Book 2nd edition, by Hector Garcia-Molina, Jeff Ullman and Jennifer Widom. ISBN: 978-0131873254, Prentice Hall, 2008</i>	5%

11	1. Students are able to explain External Storage Data	1.1. Students are able to explain File Organization and Indexing 2.2. Students are able to explain Index Data Structure 3.3. Students are able to explain file organization comparisons 4.4. Students are able to explain Performance Indexes and Tuning 5.5. Students are able to explain the impact of workload 6.6. Students are able to explain the Grouped Index Organization 7.7. Students are able to explain the Combined Search Button	Criteria: - Students can explain File Organization and Indexing well Form of Assessment : Project Results Assessment / Product Assessment	Lectures, Discussions and Presentations 2x 50"		Materials: • File Organization and Library Indexing: Database Systems: The Complete Book 2nd edition, by Hector Garcia-Molina, Jeff Ullman and Jennifer Widom. ISBN: 978-0131873254, Prentice Hall, 2008	5%
12	1. Students are able to explain External Storage Data	1.1. Students are able to explain File Organization and Indexing 2.2. Students are able to explain Index Data Structure 3.3. Students are able to explain file organization comparisons 4.4. Students are able to explain Performance Indexes and Tuning 5.5. Students are able to explain the impact of workload 6.6. Students are able to explain the Grouped Index Organization 7.7. Students are able to explain the Combined Search Button	Criteria: - Students can explain File Organization and Indexing well Form of Assessment : Project Results Assessment / Product Assessment	Lectures, Discussions and Presentations 2x 50"		Materials: • File Organization and Library Indexing: Database Systems: The Complete Book 2nd edition, by Hector Garcia-Molina, Jeff Ullman and Jennifer Widom. ISBN: 978-0131873254, Prentice Hall, 2008	5%
13	1. Students are able to explain hash-based indexes	1.1. Students are able to explain Static Characterization 2.2. Students are able to explain Extensible Hashing 3.3. Students are able to explain Linear Characterization 4.4. Students are able to explain the Characterization of Extendable vs. Expandable. Linear	Criteria: - Students can explain hash-based indexes well Form of Assessment : Project Results Assessment / Product Assessment	Lectures, Discussions and Presentations 2x 50"		Material: • hash-based index Bibliography: Database Systems: The Complete Book 2nd edition, by Hector Garcia-Molina, Jeff Ullman and Jennifer Widom. ISBN: 978-0131873254, Prentice Hall, 2008	5%

14	1. Students are able to explain the System Catalog	<p>1.1. Students are able to explain the Introduction to Operator Evaluation</p> <p>2.2. Students are able to explain Algorithms for Relational Operations</p> <p>3.3. Students are able to explain Introduction to Query Optimization</p> <p>4.4. Students are able to explain alternative plans</p> <p>5.5. Students are able to explain the Ordinary Optimizer</p>	<p>Criteria:</p> <p>- Students can explain Algorithms for Relational Operations well</p> <p>Form of Assessment :</p> <p>Project Results Assessment / Product Assessment</p>	Lectures, Discussions and Presentations 2x 50"		<p>Material: • Algorithms for Relational Operations</p> <p>Library:</p> <p>Database Systems: The Complete Book 2nd edition, by Hector Garcia-Molina, Jeff Ullman and Jennifer Widom. ISBN: 978-0131873254, Prentice Hall, 2008</p>	5%
15	1. Students are able to explain the System Catalog	<p>1.1. Students are able to explain the Introduction to Operator Evaluation</p> <p>2.2. Students are able to explain Algorithms for Relational Operations</p> <p>3.3. Students are able to explain Introduction to Query Optimization</p> <p>4.4. Students are able to explain alternative plans</p> <p>5.5. Students are able to explain the Ordinary Optimizer</p>	<p>Criteria:</p> <p>- Students can explain Algorithms for Relational Operations well</p> <p>Form of Assessment :</p> <p>Participatory Activities, Project Results Assessment / Product Assessment</p>	Lectures, Discussions and Presentations 2x 50"		<p>Material: • Algorithms for Relational Operations</p> <p>Library:</p> <p>Database Systems: The Complete Book 2nd edition, by Hector Garcia-Molina, Jeff Ullman and Jennifer Widom. ISBN: 978-0131873254, Prentice Hall, 2008</p>	5%
16	UAS	- Students can explain well the 9-15 meeting	<p>Criteria:</p> <p>- Students can explain well the 9-15 meeting</p> <p>Form of Assessment :</p> <p>Project Results Assessment / Product Assessment</p>	Demo and Simulation 2x 50"		<p>Materials: • Meetings 9-15</p> <p>Bibliography:</p> <p>Database Systems: The Complete Book 2nd edition, by Hector Garcia-Molina, Jeff Ullman and Jennifer Widom. ISBN: 978-0131873254, Prentice Hall, 2008</p>	15%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	10%
2.	Project Results Assessment / Product Assessment	90%
		100%

Notes

- Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
- The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
- Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.

4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
5. **Indicators for assessing** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.