	Universitas Negeri Surabaya Faculty of Engineering, Bachelor of Information Systems Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Database	5720103009		T=3	P=0	ECTS=4.77	2	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	I Kadek Dwi Nuryana, S.T., M.Kom.

Learning model	**Project Based Learning**

Program Learning Outcomes (PLO)

PLO study program that is charged to the course

Program Objectives (PO)

PO - 1	Students can understand and apply RDBMS to create simple database systems
PO - 2	Students understand the concept of database normalization as part of the database design quality testing method.

PLO-PO Matrix

P.O
PO-1
PO-2

PO Matrix at the end of each learning stage (Sub-PO)

P.O	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PO-1																
PO-2																

Short Course Description	This course explains the concepts and definitions of databases, starting from the components that make up a database, architecture and database design using a relational model approach (entity relationship diagram). Apart from that, the concept of mapping between the conceptual model and the physical database model is discussed. Next, the concept of database normalization is introduced as part of the database design quality testing method. After that, we studied the concept of database processing using a relational algebra notation approach which was strengthened by an introduction to the concept and implementation of the use of query language (SQL) through DDL and DML.

References

Main :

1. Ramakrishnan, Raghu, Gehrke, Johannes.2003.Database Management Systems, 3rd Edition. New York: The McGraw-Hill Companies, Inc
2. Elmasri & Navathe.2016.Fundamental of Database Systems, 7th edition.Edinburg : Pearson Education Limited.

Supporters:

Supporting lecturer	Dr. Wiyli Yustanti, S.Si., M.Kom.

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	Students are able to explain database concepts	1. Students can conclude the definition of a database 2. Students can tell the history of databases 3. Students can name the components that make up a database 4. Students can show database architecture 5. Students can name various DBMS models	**Criteria:** - **Form of Assessment** : Participatory Activities	Contextual Teaching Learning (CTL) 3 X 50	Explains the learning material in detail starting from various definitions of databases, history of databases, components that make up databases, database architecture and various database models for system management 3 X 50	**Material:** Introduction to databases **Reader:** *Elmasri & Navathe. 2016. Fundamentals of Database Systems, 7th edition. Edinburgh : Pearson Education Limited.*	3%
2	Students are able to design conceptual models of relational databases	1. Students can state the meaning of the ERD symbol 2. Students are able to define information in the real world into ERD symbols 3. Students can use ERD symbols to draw a conceptual model of a case study	**Criteria:** - **Form of Assessment** : Participatory Activities	Contextual Teaching Learning (CTL) Problem Based Learning (PBL) 3 X 50	Explains material regarding symbols in designing a relational database model using ERD 3 X 50	**Material:** Designing a conceptual model of a relational database **Reader:** *Elmasri & Navathe. 2016. Fundamentals of Database Systems, 7th edition. Edinburgh : Pearson Education Limited.*	3%
3	Students are able to map the conceptual model into the physical model of the database	1. Students can use DIA software to draw a CDM for a case study 2. Students can mention mapping rules from CDM to PDM 3. Students can use mapping rules to draw a physical database model from a case study	**Criteria:** - **Form of Assessment** : Participatory Activities	Contextual Teaching Learning (CTL) Problem Based Learning (PBL) 3 X 50	Case study exercise regarding the use of ERD symbols to draw CDM using DIA software, then explained the concept of mapping from CDM to PDM 3 X 50	**Material:** Mapping **Library:** *Elmasri & Navathe. 2016. Fundamentals of Database Systems, 7th edition. Edinburgh : Pearson Education Limited.*	3%
4	Students are able to solve database design problems using the ERD method	1. Students can translate the results of system analysis into ERD concepts 2. Students can translate the results of the ERD concept into a database in the form of tables 3. Students can determine relationships between tables	**Criteria:** - **Form of Assessment** : Participatory Activities	Contextual Teaching Learning (CTL) Problem Based Learning (PBL) 3 X 50	Provides various case studies illustrated in the form of problem solving through an example and 3 X 50 practice questions	**Material:** ERD Concept **Reader:** *Elmasri & Navathe. 2016. Fundamentals of Database Systems, 7th edition. Edinburgh : Pearson Education Limited.*	4%

5	Students are able to use certain application programs for database design	1. Students can mention various database designer software. 2. Students can draw CDM using software. 3. Students can change CDM to PDM using software. 4. Students can connect the design to the RDBMS software	**Criteria:** - **Form of Assessment** : Participatory Activities	Problem Based Learning (PBL) 3 X 50	Explains the features of database designer software and how to use it to solve CDM, PDM design cases and connections to 3 X 50 RDBMS software	**Material:** Use of certain application programs for database design. **Library:**	4%
6	Students are able to design databases using normalization techniques	1. Students can show FD from a table. 2. Students can differentiate between forms of normalization. 3. Students can normalize tables	**Criteria:** - **Form of Assessment** : Participatory Activities	Problem Based Learning (PBL) 3 X 50	Explain the concept of Functional Dependency (FD) and various forms of normalization starting from the first normal form (1st NF) to the fifth normal form (5th NF) 3 X 50	**Material:** Normalization **Bibliography:** *Ramakrishnan, Raghu, Gehrke, Johannes. 2003. Database Management Systems, 3rd Edition. New York: The McGraw-Hill Companies, Inc*	4%
7	Students are able to solve database design problems using normalization techniques	1. Students can show FD from a table. 2. Students can distinguish normal conditions from a table 3. Students can normalize tables 4. Students can draw a table relationship scheme resulting from normalization	**Criteria:** - **Form of Assessment** : Participatory Activities	Contextual Teaching Learning (CTL) Problem Based Learning (PBL) 3 X 50	Presents the various forms that exist around us and how to carry out the information decomposition process to produce a physical database design model 3 X 50	**Material:** Library Normalization **:**	4%
8	Midterm Exam (UTS)	1. Students can answer questions related to basic database concepts 2. Students can solve database design problems using ERD techniques 3. Students can solve database design problems using Normalization techniques	**Criteria:** - **Form of Assessment** : Project Results Assessment / Product Assessment	Virtual Learning 2 X 50	UTS 2 X 50	**Material:** UTS **Library:**	25%

9	Students are able to write query algorithms using relational algebra	1. Students can name the basic operators in Relational Algebra (AR) 2. Students can use AR symbols to solve problems	**Criteria:** - **Form of Assessment** : Participatory Activities	Contextual Teaching Learning (CTL) Problem Based Learning (PBL) 3 X 50	Explains the concept of relational algebra by showing various basic operations of AR 3 X 50	**Material:** Relational Algebra (AR) **References:** *Ramakrishnan, Raghu, Gehrke, Johannes. 2003. Database Management Systems, 3rd Edition. New York: The McGraw-Hill Companies, Inc*	3%
10	Students are able to solve query problems using Relational Algebra (AR) notation	1. Students can write problem solving algorithms with AR 2. Students can translate AR symbols into simple SQL syntax	**Criteria:** - **Form of Assessment** : Participatory Activities	Contextual Teaching Learning (CTL) Problem Based Learning (PBL) 3 X 50	Working on AR problems with various operations, as well as an explanation of how to convert AR symbols into SQL 3 X 50 language	**Material:** Relational Algebra (AR) **References:** *Ramakrishnan, Raghu, Gehrke, Johannes. 2003. Database Management Systems, 3rd Edition. New York: The McGraw-Hill Companies, Inc*	3%
11	Students are able to write queries using SQL (Structure Query Language)	1. Students can state the SQL syntax for DDL. 2. Students can state the SQL syntax for DML 3. Students can use Query Builder in RDBMS applications 4. Students can write SQL syntax to solve problems	**Criteria:** - **Form of Assessment** : Participatory Activities	Contextual Teaching Learning (CTL) Problem Based Learning (PBL) 3 X 50	Explains the concept of SQL syntax for both DDL and DML and is equipped with examples of writing and execution results in a 3 X 50 application program	**Material:** SQL (Structure Query Language) **Library:** *Ramakrishnan, Raghu, Gehrke, Johannes. 2003. Database Management Systems, 3rd Edition. New York: The McGraw-Hill Companies, Inc*	3%
12	Students are able to write complex SQL queries	1. Students can distinguish various types of SQL syntax for DML 2. Students can demonstrate various SQL Functions, Operators and Parameters. 3. Students can write SQL syntax to solve more complex problems	**Criteria:** - **Form of Assessment** : Participatory Activities	Contextual Teaching Learning (CTL) Problem Based Learning (PBL) 3 X 50	Discusses various types of queries, joins, where conditions, functions, operators and parameters in SQL 3 X 50 syntax	**Material:** complex SQL **Reference:** *Ramakrishnan, Raghu, Gehrke, Johannes. 2003. Database Management Systems, 3rd Edition. New York: The McGraw-Hill Companies, Inc*	4%
13	Students are able to use RDBMS to create simple database systems	1. Students can create tables in DBMS software 2. Students can create queries in RDBMS software	**Criteria:** - **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Contextual Teaching Learning (CTL) Problem Based Learning (PBL) 3 X 50	Shows how to create tables and relationship diagrams in RDBMS applications and explains the basics of creating queries to create a 3 X 50 form/report	**Material:** Use of DBMS software **Library:**	4%

14	Students are able to use RDBMS to create simple database systems	1. Students can create forms in RDBMS software 2. Students can create reports in RDBMS software	**Criteria:** - **Form of Assessment** : Participatory Activities	Contextual Teaching Learning (CTL) Problem Based Learning (PBL) 3 X 50	Shows how to create a 3 X 50 form and report	**Material:** Use of DBMS software **Library:**	4%
15	Students are able to use RDBMS to create simple database systems	Students can create Switchboard applications with RDBMS software	**Criteria:** - **Form of Assessment** : Participatory Activities	Contextual Teaching Learning (CTL) Problem Based Learning (PBL) 3 X 50	Shows how to create a form for a 3 X 50 switchboard manager/main menu	**Material:** Use of DBMS software **Library:**	4%
16	Final Semester Examination (UAS)	Students Can Demonstrate Final Project Results in Making an RDBMS	**Criteria:** - **Form of Assessment** : Project Results Assessment / Product Assessment	Project Based Learning 2 X 50	UAS 2 X 50	**Material:** UAS **Literature:**	25%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	48%
2.	Project Results Assessment / Product Assessment	52%
		100%

Notes

1. **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.
2. **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.
3. **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** ability in the process and student learning outcomes are specific and measurable statements that identify the ability 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.