|  |  |  |
| --- | --- | --- |
|  | **UNIVERSITAS NEGERI PADANG****FACULTY OF ENGINEERING****ELECTRONIC DEPARTMENT****INFORMATIC EDUCATION STUDY PROGRAM** | **Document Code** |
| **SEMESTER LEARNING PLAN (SLP)** |
| **COURSES** | **CODE** | **Course Group** | **Credit Point(s)** | **SEMESTER** | **Date Of Creation** |
| **Sistem Basis Data****(Database System)** | TIK 1.61.2305 | Study Program Compulsory Courses | 2 credits (theory) | II | July 2017 |
| **AUTHORIZATION** | **Lecturer** | **Course Coordinator** | **Coordinator of Study Program** |
| **Dr. Elfi Tasrif, MT****NIP. 196205241987031002** | **Dr. Elfi Tasrif, MT****NIP. 196205241987031002** | **Ahmaddul Hadi, S.Pd., M.Kom.****NIP. 197612092005011003** |
| **Learning Outcomes (LO)** | **PLO** |  |
| PLO-S1 | Have faith in God Almighty and able to show a religious attitude. |
| PLO-S9  | Demonstrate an attitude of responsibility for work in their field of expertise independently |
| PLO-P6 | Understand the basic concepts of mathematics, electrical and electronic science in the field of computers |
| PLO-KU5 | Able to make decisions appropriately in the context of problem-solving in their area of ​​expertise, based on the results of information and data analysis. |
| PLO-KK6  | Ability to master basic mathematics, electrical and electronic science concepts for the development of computer systems |
| **CO** |  |
| CO-1 | Understand and analyze, design, and implement databases and apply database programming to produce applications. |
| CO-2 | Applying concepts related to information management, including compiling data modeling and building software applications for data organizing and ensuring data access security |
| **Course Description** | This course provides an understanding and mastery of database concepts, relational data models, database formation techniques and normalization, as well as database application programming in the development of computer-based data processing systems. |
| **Course Matter** | * File Systems & Database Systems
* Data Types, Structure, and Data Boundaries
* Database Users
* Data Models & Schemes
* Relational Database
* Database Design
* Entity Relationship Diagram (ERD)
* Normalization
* Decomposition
* DDL and DML
* Relational Algebra
 |
| **Reference** | Main: |  |
| 1. Silberschatz, A., Korth, H.F. & Sudarshan, S., 2011. Database System Concepts Sixth Edition. New York: McGraw-Hill.
2. Elmasri, R. & Navathe, S.B., 2011. Fundamentals of Database System Sixth Edition. Boston: Addison-Wesley.
3. Raghu Ramakrishnan and Johannes Gehrke. 2003. Database Management Systems Third Edition. McGraw-Hill
4. C. J. Date. 2006. An Introduction to Database Systems 8th. Pearson Education
5. Jeffrey Ullman, Jennifer Widom, and Hector Garcia-Molina. 2013. Database Systems: Pearson New International Edition: The Complete Book.
 |
|
|
| **Media** | **Software:** | **Hardware :** |
| Personal Computers, Papers, Powerpoint | LCD & Projector |
| **Lecturer** | - |
| **Prerequisites** | **Dr. Elfi Tasrif, MT** |
| **Weeks-** |  **Sub-CO****(Expected Final Ability in each learning stage)** | **Assessment Indicator**  | **Assessment Criteria** | **Learning Method, Students’ Learning Experience****[Time Allocation]** | **Learning Material** **[Topic from Reference]** | **Score (%)** |
| **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
| 1 | Students can distinguish between file systems and database systems in data storage and processing | 1. Accuracy describes files and data
2. Explain and explain about Database Concepts and Database Management Systems
 | **Criteria:**Lectures, Problem based learning, assignments | **Lecture**Presentation**[TM: 1x (2x50 ")]****Independent****[BM: 1x (2x60 ”)]****Task 1**Describes the differences between file systems and database systems in data storage and processing**[BT: 1x (2x60 ")]** | * Traditional Files
* Database Approach
* Concept of Database and Database Management System (DBMS)
* The advantages and disadvantages of a DBMS

**[1], [2], [3], [4], [5]** | **15%** |
| 2 | Students can define data types, structures and data limitations stored in the database | 1. Accuracy in describing data types, data structures and data boundaries.
 | **Criteria:**Lectures, Problem based learning, assignments | **Lecture**Presentation**[TM: 1x (2x50 ")]****Independent****[BM: 1x (2x60 ”)]****Task-2**Describes the definition of data types, structures and limitations of data stored in the database**[BT: 1x (2x60 ")]** | * Structure and Components in a DBMS
* Database Characteristics

**[1], [2], [3], [4], [5]** | **10%** |
| 3 | Students can define database users | 1. Accuracy in analyzing who is a database user from a given case study.
2. The accuracy in differentiating the access of each database user.
 | **Criteria:**Lectures, Problem based learning, assignments | **Lecture**Presentation**[TM: 1x (2x50 ")]****Independent****[BM: 1x (2x60 ”)]****Task-3**Describe database users**[BT: 1x (2x60 ")]** | * Database users
* Database Administrator (DBA)
* User interface

**[1], [2], [3], [4], [5]** | **10%** |
| 4 - 5  | Students can build data models and schemes | 1. Accuracy in building data models and schemes,
2. Accuracy in building internal, conceptual and external schemes.
 | **Criteria:**Lectures, Problem based learning, assignments | **Lecture**Presentation**[TM: 2x (2x50 ")]****Independent****[BM: 2x (2x60 ")]****Task-4**Explains how to build data models and schemes**[BT: 2x (2x60 ")]** | Concept and Architecture of Database Systems* Data models, schemas and instances
* Database architecture
* Data independence
* Database languages

**[1], [2], [3], [4], [5]** | **10%** |
| 6 - 7  | Students can understand the concept of relational databases, and are able to build relational database models and limits of relational databases | 1. Accuracy in using PK and FK.
2. Accuracy in analyzing and building RAT.
 | **Criteria:**Lectures, Problem based learning, assignments | **Lecture**Presentation**[TM: 2x (2x50 ")]****Independent****[BM: 2x (2x60 ")]****Task-4**Explain the concept of relational databases**[BT: 2x (2x60 ")]** | **Relational Database*** Introduction to relational databases
* Key
* Schematic Diagram / Relationship Between Tables (RAT)

**[1], [2], [3], [4], [5]** | **10%** |
| **8** | **Midterm Midterm Exam: Formative evaluation that is intended to improve the learning process based on the assessment that has been carried out** |
| 9 | 1. Students can understand the use of Entities and Relationships in modeling data, which is known as the ER-model 2. Students can analyze and determine what are the existing entities and their attributes from a given case | 1. Accuracy in understanding the concept of entities and weak entity.
2. Accuracy in analyzing the relationships that occur between entities and their cardinalities.
 | **Criteria:**Lectures, Problem based learning, assignments | **Lecture**Presentation**[TM: 1x (2x50 ")]****Independent****[BM: 1x (2x60 ”)]****Task-5**Describe the database design with ER model**[BT: 1x (2x60 ")]** | **Database Design with ER Model*** Introduction to the ER Model
* Entities and Attributes
* Relation
* Cardinality
* *Weak Entity*

**[1], [2], [3], [4], [5]** | **15%** |
| 10-11  | Students can analyze how each entity is related from a given case, and then build the model using ERD. | 1. Accuracy in analyzing how each entity is related
2. Accuracy in building ERD.
3. The accuracy in building RAT, CDM and PDM from ERD.
 | **Criteria:**Lectures, Problem based learning, assignments | **Lecture**Presentation**[TM: 2x (2x50 ")]****Independent****[BM: 2x (2x60 ")]****Task-7**Explains ERD**[BT: 2x (2x60 ")]** | ***Entity Relationship Diagram* (ERD)*** Introduction to ERD
* Basic Structure of ERD
* Binary and Non-Binary Relationships
* Mapping of Cardinalities
* Sample case
* ERD - RAT conversion
* ERD - CDM and PDM conversion

**[1], [2], [3], [4], [5]** | **10%** |
| 12-14 | Students can understand the concept of normalizationStudents can build 1NF, 2NF to 3NF | 1. Describes the normalization process of 1NF, 2NF to 3NF
2. Perform normalization and decomposition of 1NF, 2NF and 3NF tables
 | **Criteria:**Lectures, Problem based learning, assignments | **Lecture**Presentation**[TM: 3x (2x50 ")]****Independent****[BM: 3x (2x60 ")]****Task-8**Explain the concept of normalization**[BT: 3x (2x60 ")]** | * 1NF decomposition
* 2NF decomposition
* 3NF decomposition

**[1], [2], [3], [4], [5]** | **10%** |
| 15 | Students are able to make DDL and DML | 1. Make DDL
2. Create DML
 | **Criteria:**Lectures, Problem based learning, assignments | **Lecture**Presentation**[TM: 1x (2x50 ")]****Independent****[BM: 1x (2x60 ”)]****Task-9**Describes DDL, DML**[BT: 1x (2x60 ")]** | * Relational Database Language
* DDL
* Defining Data in SQL
* Schema & Catalog concept
* Command Create Table, Data Type andLimitation
* Drop orders
* Alter's orders

**[1], [2], [3], [4], [5]** | **10%** |
| **16** | **Semester Final Examination: Evaluation which is intended to determine the final achievement of student learning outcomes** |