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|  | | **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. | | | | | | | | | | | | |
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| **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 normalization  Students 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** | | | | | | | | | | | | | | |