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| **The learner must demonstrate understanding of:** | **Through:** | **The facilitator must discuss the following topics:** | **Through:** |
| * 1. Datatypes in SQL   2. SQL commands to create a table, inserting records into the table, and extracting information from the table   3. Aggregate functions, GROUP BY clause   4. Implementation of constraints in SQL using CHECK, PRIMARY KEY, FOREIGN KEY, NOT NULL, UNIQUE commands | 1. Short quizzes 2. Written examination 3. Recitation | 1. Structured Query Language 2. Data Types 3. Functions 4. Data Manipulation 5. Table Modification/ Truncation 6. Constraints 7. Joins 8. Sets | 1. Lecture 2. Demonstration 3. Discussion 4. Reporting |
| 1. Various phases in database design 2. Database design tools 3. Identify modification anomalies in tables 4. Functional dependency, Armstrong’s axioms 5. Concept of normalization and different normal forms 6. Denormalization | 1. Short quizzes 2. Board work 3. Written examination | 1. Database Design Objectives/Purpose 2. Database Design Tools 3. Redundancy 4. Functional Dependency / Inference Rules 5. Normalization 6. Denormalization | 1. Lecture 2. Demonstration 3. Discussion 4. Reporting |
| **The learner must demonstrate the ability to:** | **Through:** | **The facilitator must guide the learner in:** | **Through:** |
| 1. Create and maintain a normalized MySQL database 2. Perform efficient queries to a large database | 1. Board work 2. Group activity/case study 3. Major project | The Design and Implementation of a fully normalized database, with prepared statements and views | 1. Demonstration 2. Consultation |
| 1. Integrate the database into an application by creating models and data access objects | 1. Major project | 1. OOP principles 2. MVC architecture 3. DAO design pattern | 1. Demonstration 2. Consultation |