Course Outline

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| **Title** | **Database Systems Lab** | | | | | |
| Code | **IT-244** | | | | | |
| Credit Hours | 1  Lab/week:  Weight 1 Cr. Hrs.  Contact Hours 3 Hrs. Lectures: 1  Duration 3 Hrs. | | | | | |
| Instructor | Fiaz Majeed, Muhammad Umair | | | | | |
| Prerequisite  Skill/Knowledge/Understanding | Basic Programming:   * Students have concepts of Information Technolgy * Concepts of Programming language are essential | | | | | |
| Program Name | BS (IT) | | | | | |
| Aims and Objectives | * To provide understanding of the principles of database Analysis, Design and modeling techniques especially for creation of relational databases. * To have a fairly good practice in conceptual modeling using entity relationship diagrams. * To learn how queries in SQL can be written correctly and efficiently * To learn about transaction processing in database management systems | | | | | |
| Learning Outcomes | * Student will understand the requirements of Database Systems * Student can Design and Implement Databases using any DBMS * Students will have the expertise of SQL. * Good concepts of modeling techniques (ERD) * He knows when to implement a Centralized and Distributed environments. * Students will capable of designing and implementing real time solutions of database related problems. | | | | | |
| Text Book/s | A. Thomas Connally \* Carolyn Begg “Database Systems”, 3rd Ed., ISBN 0-515-13038-9 B. Database Systems Principles, Design, and Implementation by Catherine Ricardo | | | | | |
| Reference Books/Material | 1. Fred Mc Fadden, Jeffry A Hoffer, and Merry Prescot “Modern Database Management”, 5th Ed., Wesley Logman, 2001. ISBN 0-201-47432-82 2. C. J. DATES “Database Management Systems”8th Ed. 2001. ISBN 0-901-543432-8 3. Database System.Design Implementation and Management. By Rob Coronel | | | | | |
| Instructional Aids/Resources | * Windows Environment * Oracle 10g client & Server * Erwin / DB Designer * Multimedia in Labs * Photocopy Facility for Handouts/Case Studies * E-Books (Provided) | | | | | |
| Assessment Criteria |  | Sessional 25% | Mid 25% | Final 50% | Total 100% |  |
| Quizzes, Test, 05 | Paper: 25 | Paper 50 |  |
| Project 15 |  |  |  |
| Assignment 05 |  |  |  |
| Recommendations | \*Project is the compulsory part of this Course.  Marks division for sectional or project may vary on the basis of complexity of project or available time for project execution and documentation. | | | | | |

# Grading Policy:

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| **1** | **Assignments** | **10%** |
| **2** | **Quizzes** | **5%** |
| **3** | **Project Presentation** | **10%** |
| **3** | **Mid term** | **25%** |

**4**   **Final Exam 50%**

# Quizzes:

A number of quizzes will take place in the class to measure the learning progress of the students. These quizzes will be announced or unannounced.

Assignm

ents

Quizzes

Presenta

tion

Mid

Term

Final

Exam

# Plagiarism Policy:

During this course a strict no tolerance plagiarism policy will be adopted regarding class assignments and term projects. While collaboration in this course is highly encouraged, you must ensure that you do claim other people’s work/idea as your own. Plagiarism occurs when the words, ideas, assertion, theories, figures, images, programming code of others is presented as your own work. Failing to comply with plagiarism policy will lead to strict penalties including zero marks in assignments.

Sixteen Week Plan:

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| **Week** | **Topic** | | **Source**  (Book-Chapter  No. Section  No.) | **Recommendations for Learning Activities** |
| 1 | ***Introduction of Oracle:***   * Introduction * Features * Usability | | Text A-Ch1  Text B-Ch1 | * Distribution of Course Outline * Discuss its objective * Prerequisite Test |
| 2 | ***Installation and Configuration Of Oracle:***   * Path Selection * Installation and Configuration Of Oracle: * Password Setting * Path Selection * Login * SQL+ * Commands to Manipulate Login * Commands to Manipulate | | Text A –Ch1 |  |
| 3 | ***Introduction to SQL:***  **Objective of SQL**   * History of SQL * Importance & Environment of SQL * Categories of SQL Commands * DML * DDL * DCL   **Data Definition: Creating a Database**   * Creating Tables •  Altering Table * Dropping Table * Creating Index * Removing Index | | Text A –Ch5  Text A- Ch 2 |  |
| 4 | **Data Integrity:**   * Types of Data integrity: * Entity Integrity * Domain Integrity * Referential Integrity * User-defined Integrity | | Text A –Ch6 | Assignment:1 |
| 5 | **Constraints:**   * PRIMARY KEY Constraint * UNIQUE Constraint * IDENTITY Property * DEFAULT Definition * FOREIGN Key Constraint * CHECK Constraint * NOT NULL Constraint * Rules | | Text A –Ch6  Text B-Ch5 | Quiz 1 |
| 6 | ***Data Manipulation:***  Understanding the SELECT command Format   * The SELECT Clause * The FROM Clause * The WHERE Clause | | Text A –Ch5 | Assignment 2 |
| 7 | ***Use of Operators:***   * Relational Operators * Logical Operators * Wildcard Characters * Understanding the NULL values and Expressions * ORDER BY Clause | | Text A –Ch5 |  |
| 8 | ***Aggregate Functions in SQL***   * The GROUP BY Clause * The HAVING Clause * Querying from Multiple Tables * UNIION * Sub Query | | Text A –Ch5 | Quiz:2 |
| Mid Term Exam | | | | |
| 9 |  | **Types of Sub Query**  Nested Sub query  Single row sub query  Multiple row sub query  Correlated Sub query Parameters Queries | Text A –Ch5 | Assignment of Term Project |
| 10 |  | Types of Joins  Inner join  Outer Join  Left outer join  Right outer join | Text A –Ch5 | Quiz 3 |
| 11 | **Views:** | Creating Views  Removing views  Restrictions on Views  Updating Views  Advantages and Disadvantages  View Materialization | Text A –Ch6 | Assignment:3 |
| 12 | **Changing the Content of Tables using Action Queries**   * The INSERT table Statement * The DELETE table Statement * The UPDATE table Statement * Append Action Query | | Text A –Ch7 |  |
| 13 | **Indexes**   * Types of Indexes * Indexed sequential Files * Secondary indexes * Multilevel indexes * B+ trees * Clustered, Non Clustered Indexes | | Text B –Ch6 |  |
| 14 | **Transaction Management:**   * Transaction * Transaction and Scheduling   Properties of successful transactions. | | Text A –Ch17 | Assignment 4 |
| 15 | * Concurrent Execution of Transactions * Serialzability * Lock-Based Concurrency Control * Deadlocks | | Text A –Ch19 Text B-Ch12 | Quiz 4 |
| 16 | * Incremental Log with Deferred Updates * Incremental Log with immediate Updates * Concurrency Control | | Text A –Ch19 | Term Project Evaluation |
| Final Term Exam | | | | |