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|  | Islamia University Bahawalpur Department of Computer Science Course Plan |
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| Department Computer Science | Semester No 03 (Spring 2024) | Email: Muhammad.usman@iub.edu.pk |
| Course Title Database System | Code COSC-2103 | Credit Hours 3-1-4 |
| Faculty Muhammad Usman Ghani | Class BSCS 4 th Evening, A,B | Office 1.77 |

TEXT AND MATERIAL:

Text Book

1. Database Systems: A Practical Approach to Design, Implementation, and Management, 6th Edition by Thomas Connolly and Carolyn Begg

Reference Material:

1. Database Systems: The Complete Book, 2nd Edition by Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom
2. Database System Concepts, 6th Edition by Avi Silberschatz, Henry F. Korth and S. Sudarshan

COURSE DESCRIPTION:

The course aims to introduce basic database concepts, different data models, data storage and retrieval techniques, and database design techniques. The course primarily focuses on relational data models and DBMS concepts.

COURSE LEARNING OUTCOMES:

Upon completion of this course, the student should be able to:

| S No | CLO Statement | PLO | Learning Domain and Level |
|------|--|-----|---------------------------|
| CLO1 | Explain fundamental database concepts. | 1 | C2 |
| CLO2 | Design conceptual, logical and physical database schemas using different data models. | 2 | C5 |
| CLO3 | Identify functional dependencies and resolve database anomalies by normalizing database tables | 3 | C2 |
| CLO4 | Use Structured Query Language (SQL) for database definition and manipulation in any DBMS | 4 | C4 |

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ASSESSMENT SYSTEM:

| Theoretical/Instruction | 100% |
|--------------------------------|-------------|
| <i>Assignments</i> | 5% |
| <i>Quizzes</i> | 5% |
| <i>CEPs/Project</i> | 10% |
| <i>Midterm Exam</i> | 30% |
| <i>End Semester Exam</i> | 50% |
| Total | 100% |

- ATTENDANCE WILL BE TAKEN REGULARLY. IT IS THE RESPONSIBILITY OF STUDENTS TO MAINTAIN 75% ATTENDANCE.
- EXCUSES FOR OFFICIALLY AUTHORIZED ABSENCES MUST BE PRESENTED NO LATER THAN ONE WEEK FOLLOWING RESUMPTION OF CLASS ATTENDANCE.
- LATE ASSIGNMENTS **WILL NOT** BE ACCEPTED
- A STUDENT CAUGHT CHEATING IN ANY OF THE ASSIGNMENTS WILL GET 0 OUT OF 5%.
- NO MAKEUP WILL BE MADE FOR MISSING QUIZZES OR EXAMS.

TOPICS COVERED

| Week | Topic |
|-------------|--|
| 1 | Database-System Applications |
| | Purpose of Database Systems, system, database architecture, three level schema architecture, |
| | Database Design |
| 2 | Structure of Relational Database |
| | Database Schema, keys |
| 3 | Overview of the SQL Query Language |
| | SQL Data Definition, Additional Basic Operation |
| | Assignment-1 |
| 4 | Set Operations |
| | Aggregate Functions |
| 5 | Nested Subqueries |
| | Quiz-1 |
| | 3 Basic Structure of SQL Queries |
| 6 | Modification of the Database |
| | Relational Algebra and Relational Calculus |

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| 7 | SQL Data Types and Schemas, Views |
| | Quiz -2 and Revision |
| 8 | Mid Term |
| 9 | Join Expressions |
| 10 | Quiz -3, Project allocation, Assignment 1 Solution |
| | Assignment-2 |
| | Database System Development Lifecycle |
| 11 | Database Analysis and the DreamHome Case Study |
| 12 | Entity–Relationship Modeling |
| 13 | Normalization |
| 14 | Quiz-4- Assignment 2 Solution |
| | Methodology—Conceptual Database Design |
| 15 | Methodology—Logical Database Design for the Relational Model |
| | Project Presentations |
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| 16 | Final Term |