

University of Asia Pacific (UAP)
Department of Computer Science and Engineering (CSE)

Course Outline

Program:	Computer Science and Engineering (CSE)
Course Title:	Database System
Course Code:	CSE 211
Semester:	Spring-2019
Level:	4 th Semester
Credit Hour:	3.0
Name & Designation of Teacher:	Nadeem Ahmed, Associate Professor
Office/Room:	701 (B) , 7th Floor, teacher's compound
Class Hours:	Monday: 12:30-02:00 p.m. & Wednesday: 09:30-11:00 a.m.
Consultation Hours:	Tuesday: 02:30-04:30 p.m.
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Rationale:	(a set of reasons or a logical basis for a course of action or a particular belief.) Required course and a pre-requisite to System Analysis and Design, and Visual and Web Programming in the CSE program. This knowledge is very important for the field of software development.
Pre-requisite (if any):	CSE 205: Data Structure

Course Synopsis:

Introduction: Purpose of DBMS, Entity-Relationship Model, Relational Model, Integrity Constraints: Referential Integrity, Functional Dependency, Relational Database Design: Decomposition and Normalization, Storage and File Structure: Database Backup and Recovery in Disaster, Indexing and Hashing, Structured Query Language (SQL), Procedural Language (PL), Stored Procedures (SP), Trigger, Cursor, Function, Transactions, Job Scheduling, Concurrency Control, Database Architecture: Parallel

and distributed Databases, Security System, Database Servers Configuration, Data Transmission Services (DTS), Performance Tuning and Optimization.

Course Objectives (CO):

The objectives of this course are:

(See list of action verbs for CO)

1. To **provide** knowledge and understanding on principles of database management system, database technology, and applications.
2. To **introduce** how to represent data in a database and how to manage for an organization.
3. To **Learn** conceptual database modeling, professional relational database design, and database language (SQL)
4. To **enable** the student to acquire skills in solving business problem using the fundamentals of database modeling, enterprise analysis and design.
5. To **emphasize** on efficient database modeling, quality enhancement of database transaction, concurrency control and security.

Learning Outcomes (LO):

Upon completion of the course, the students will be able to:

(See list of action verbs for LO)

1. **Describe** the objective of DBMS, database concept, and structure.
2. **Explain** terms related to database design and management
3. **Understand** and **apply** normalized concept of data modeling and database development process knowledge.
4. **Use** different DBMS and the database language (SQL) for managing database of industry.
5. **Analyze** and enhance database design performance.
6. **Design and develop** logical database design for big industrial and business process.

Teaching-learning and Assessment Strategy: Lectures, assignments, quizzes, exams

Linkage of LO with Assessment Methods & their Weights:

LO	Assessment Method	(%)
1 – 3	Quiz	10
1 – 6	Class attendance	10
4,5,6	Assignment	10
1– 4	Midterm Exam	20
1 – 6	Final Exam	50

Minimum attendance: 70% class attendance is mandatory for a student in order to appear at the final examination.

Mapping of Course LO and Generic Skills:

Learning Outcome (LO) of the Course	Generic Skills* (Appendix-1)											
	1	2	3	4	5	6	7	8	9	10	11	12
Describe the objective of DBMS, database concept, and structure.	√											
Explain terms related to database design and management	√											
Understand and apply normalized concept of data modeling and database development process knowledge.		√	√	√								
Use different DBMS and the database language (SQL) for managing database of industry.		√	√		√							
Analyze and enhance database design performance.		√		√	√							
Design and develop logical database design for big industrial and business process.			√	√	√				√	√		

Lecture Schedule

Week	Topics	<u>Reading Materials</u>
1	Introductory Class, Introduction to DBMS, File System vs DBMS, Database Applications	Chap: 1, Database System Concept (6th Edition) and lecture slide
2	Instance, Schema, Data Abstraction, DBMS Components, Language, User & Administrators.	Chap: 1, Database System Concept (6th Edition) and lecture slide
3	Data Model, Database Design and E-R Model (Model, Attributes, Mapping Relations, Keys etc)	Chap: 2,7, Database System Concept (6th Edition) and lecture slide
4	E-R Schema to Table, Relational Models, Relational Algebra	Chap: 2,7, Database System Concept (6th Edition) and lecture slide

	CT-1	
5,6	Query Languages (SQL)	Chap: 3, Database System Concept (6th Edition) and lecture slide
7	Advance SQL, Integrity Constraints, Embedded SQL.	Chap: 4,5, Database System Concept (6th Edition) and lecture slide
	CT-2	
8	Mid-Term Exam	
9	Functional Dependency, Normalizations	Chap: 8, Database System Concept (6th Edition) and lecture slide
10	Application Design and Development	Chap: 9, Database System Concept (6th Edition) and lecture slide
11	Storage and File Structure, Index and Hashing	Chap: 10,11, Database System Concept (6th Edition) and lecture slide
12	Transaction, Concurrency Control	Chap: 14,15, Database System Concept (6th Edition) and lecture slide
	CT-3	
13	Deadlock, Recovery System	Chap: 16, Database System Concept (6th Edition) and lecture slide
14	Database System Architecture,	Chap: 16, Database System Concept (6th Edition) and lecture slide
15	Parallel & Distributed Database	Lecture note & slide
16	Overview and CT4	
	CT-4	
	Final Exam	

Required References: Database System Concept (6th Edition)
- Silberschatz, Korth, Sudarshan

Recommended References: Database Management System (4th Edition)

- Grading System:** As per the approved grading scale of University of Asia Pacific (Appendix-2).
- Student's responsibilities:** Students must come to the class prepared for the course material covered in the previous class (es).
They must submit their assignments on time.
No late or partial assignments will be acceptable. There will be no make-up quizzes.

Appendix-1: Generic Skills

No.	Generic Skills
1.	Engineering Knowledge
2.	Problem Analysis
3.	Design/Development of Solutions
4.	Investigation
5.	Modern Tool Usage
6.	The Engineer and Society
7.	Environment and Sustainability
8.	Ethics
9.	Communication
10.	Individual and Team Work
11.	Life Long Learning
12.	Project Management and Finance

Generic Skills (Detailed):

1. **Engineering Knowledge (T)** -Apply knowledge of mathematics, sciences, engineering fundamentals and manufacturing engineering to the solution of complex engineering problems;
2. **Problem Analysis (T)** – Identify, formulate, research relevant literature and analyze complex engineering problems, and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences;
3. **Design/Development of Solutions (A)** –Design solutions, exhibiting innovativeness, for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, economical, ethical, environmental and sustainability issues.
4. **Investigation (D)** Conduct investigation into complex problems, displaying creativeness, using research-based knowledge, and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions;
5. **Modern Tool Usage (A & D)** -Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations;
6. **The Engineer and Society (ESSE)** -Apply reasoning based on contextual knowledge to assess societal, health, safety, legal, cultural, contemporary issues, and the consequent responsibilities relevant to professional engineering practices.

7. **Environment and Sustainability (ESSE)** -Understand the impact of professional engineering solutions in societal, global, and environmental contexts and demonstrate knowledge of and need for sustainable development;
8. **Ethics (ESSE)** –Apply professional ethics with Islamic values and commit to responsibilities and norms of professional engineering code of practices.
9. **Communication (S)** -Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;
10. **Individual and Team Work (S)** -Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
11. **Life Long Learning (S)** -Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
12. **Project Management and Finance (S)** -Demonstrate knowledge and understanding of engineering management and financial principles and apply these to one's own work, as a member and/or leader in a team, to manage projects in multidisciplinary settings, and identify opportunities of entrepreneurship.

Appendix-2: Grading Policy

Numeric Grade	Letter Grade	Grade Point
80% and above	A+	4.00
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.50
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.00
55% to less than 60%	B-	2.75
50% to less than 55%	C+	2.50
45% to less than 50%	C	2.25
40% to less than 45%	D	2.00
Less than 40%	F	0.00

Prepared by:

Checked by:

Approved by:
(Head of the Detp.)
