

Maulana Abul Kalam Azad University of Technology
(Formerly West Bengal University of Technology)
Syllabus and Curricular Mapping for B. Tech. in Computer Science and Engineering
Effective from Academic Session 2023-24

SEMESTER – VI

THEORY

Course Title: Database Management Systems	Code: PCC- CS601
Type of Course: Theory	Course Designation: Compulsory
Semester: 6th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC- CS601.CO1	Describe the basic concept of database and different database models along with database languages like DDL, DML etc, Data Abstraction, and Data Independence.	Describe	K1
PCC- CS601.CO2	Identify different approaches for solving queries such as Relational algebra, Tuple and domain relational calculus, considering the query optimization strategies, and different normal forms for relational database normalization.	Identify	K3
PCC- CS601.CO3	Evaluate the applications of different storage strategies such as Indices, B-trees, hashing	Evaluate	K5
PCC- CS601.CO4	Understand the transaction processing and concurrency control strategies including ACID property, serializability of scheduling, locking and timestamp based schedulers, Database recovery.	Understand	K2
PCC- CS601.CO5	Analyze the database security approaches including authentication, authorization and access control, DAC, MAC and RBAC models, intrusion detection, SQL injection etc.	Analyze	K4
PCC- CS601.CO6	Explain the advanced concepts related to DBMS such as object oriented and object relational databases, logical databases, web databases, distributed databases, data warehousing and data mining.	Explain	K2

Mapping of COs with POs and PSOs (Course Articulation Matrix):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	1	1	-	-	-	-	-	-	1	2	-
CO2	2	-	2	2	-	-	1	-	-	-	-	-	2	-
CO3	-	2	2	2	2	-	-	2	-	-	1	-	3	1
CO4	1	3	3	1	2	-	-	-	-	-	-	-	3	2
CO5	1	2	-	2	1	-	-	-	-	-	2	-	2	-
CO6	2	2	2	2	2	3	-	-	-	-	-	-	2	1
AVG.	1.6	2.2	2.2	1.6	1.6	3	1	2	0	0	1.5	1.00	2.33	1.33

University Syllabus :

Unit	Content	Hrs/Unit
1	Database system architecture: Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML). Data models: Entity-relationship model, network model, relational and object oriented data models, integrity constraints, data manipulation operations.	9

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2	Relational query languages: Relational algebra, Tuple and domain relational calculus, SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQLserver. Relational database design: Domain and data dependency, Armstrong's axioms, Normal forms, Dependency preservation, Losslessdesign. Query processing and optimization: Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms.	13
3	Storage strategies: Indices, B-trees, hashing.	3
4	Transaction processing: Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp based schedulers, Multiversion and optimistic Concurrency Control schemes, Database recovery.	5
5	Database Security: Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection.	3
6	Advanced topics: Object oriented and object relational databases, Logical databases, Web databases, Distributed databases, Data warehousing and data mining.	3

Course Title: Database Management System Lab	Code: PCC-CS691
Type of Course: Practical	Course Designation: Compulsory
Semester: 6th	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS691.CO1	Analyze and transform an Entity Relationship Model into a relational database schema and to use a data definition language to implement the schema using a DBMS	Analyze	K4
PCC-CS691.CO2	Declare and enforce integrity constraints on a database using a DBMS	Declare	K1
PCC-CS691.CO3	Populate and query a database using SQL DML/DDDL commands.	Populate	K3
PCC-CS691.CO4	Retrieve of data from a database.	Retrieve	K3
PCC-CS691.CO5	Describe and implement relational algebra expression using aggregate functions, joins and sub-queries.	Describe	K1
PCC-CS691.CO6	Compile programs in PL/SQL including stored procedures, stored functions, cursors, packages.	Compile	K6

Mapping of COs with POs and PSOs (Course Articulation Matrix):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	1	3	1	-	1	2	-	1	2	2	1
CO2	3	2	3	2	3	1	-	-	2	-	1	2	2	1
CO3	3	2	3	2	3	1	-	2	2	-	1	2	2	1

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CO4	3	2	3	2	3	1	-	2	2	-	1	2	2	1
CO5	3	2	3	3	3	1	-	2	2	-	1	2	2	1
CO6	3	2	3	2	3	1	-	2	2	-	1	2	2	1
AVG.	3	2	3	3	3	1	0	1.8	2	0	1	2	2	1

University Syllabus :

Unit	Content
1	Structured Query Language <ul style="list-style-type: none"> Creating Database Creating a Database Creating a Table Specifying Relational Data Types Specifying Constraints Creating Indexes
2	Table and Record Handling INSERT statement, Using SELECT and INSERT together, DELETE, UPDATE, TRUNCATE statements, DROP, ALTER statements
3	Retrieving Data from a Database <ol style="list-style-type: none"> The SELECT statement Using the WHERE clause Using Logical Operators in the WHERE clause Using IN, BETWEEN, LIKE, ORDER BY, GROUP BY and HAVING Clause Using Aggregate Functions Combining Tables Using JOINS Subqueries
4	Database Management <ul style="list-style-type: none"> Creating Views, Creating Column Aliases, Creating Database Users, Using GRANT and REVOKE
5	Cursors in Oracle PL / SQL <ul style="list-style-type: none"> Writing Oracle PL / SQL Stored Procedures