Gyanmanjari
Innovative University

Subject : Fundamentals of Database Management System - BSCIT11302

Type of course: Major Core

Prerequisite: Basic Knowledge of Computer

Rationale:

This subject is associated with the designing of databases for business, scientific and engineering applications. By the end of this course the students will be able to write simple and advanced PL/SQL code blocks, use advanced features such as ref cursors and bulk fetches and database designing with normalization. Hence students will be able to design relational database which will help them in designing phase of projects in forthcoming semester.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P	C	SEE		CCE			
				Theory	Practical	MSE	LWA	ALA	
3	0	2	4	75	25	30	20	50	200

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; SEE - Semester End Evaluation; MSE- Mid Semester Examination; LWA - Lab Work Assessment; V – Viva voce; CCE-Continuous and Comprehensive Evaluation; ALA- Active Learning Activities.

3 Credits * 25 Marks = 75 Marks (each credit carries 25 Marks) Theory

1 Credits * 25 Marks = 25 Marks (each credit carries 25 Marks) Practical

SEE 100 Marks will be converted in to 50 Marks

CCE 100 Marks will be converted in to 50 Marks

It is compulsory to pass in each individual component.

Course Content:

Sr. No.	Course content	Hrs	% Weightage
1	**Introduction of Database System :** Concepts and Definitions database and database systems and database environment, Data, Information, Data Item or Fields, Records, Metadata, Data dictionary and it's components, Data Administrator (DA) and Database Administrator (DBA) , Functions and Responsibilities of DBA, Advantage and disadvantages of DBMS.	10	25%
2	**Database System Architecture :** Schemas, Sub-schemas, and Instances , Three-level ANSI SPARC Database Architecture: Internal Level, Conceptual Level, External Level, Advantages of three schema Architecture, Data Independence, Physical Data Independence, Logical Data Independence, Types of Database System: Centralized Database System, Distributed Database System	08	20%
3	**Introduction to SQL commands :** Data types, Database Language commands: Data Definition Language (DDL): CREATE, ALTER, TRUNCATE, DROP Data Manipulation Language (DML): INSERT, SELECT, UPDATE, DELETE, 5 Operators Arithmetic, Comparison, Logical SQL functions- Single row function. Date functions (add-months, months-between, round, truncate). Numeric Functions (abs, power, mod, round, trunc , sqrt) . Character Functions (initcap, lower, upper, ltrim, rtrim, replace, substring, instr) ,Conversion Functions (to-char, to-date, to-number)	06	20%
4	**Database Integrity Constraints :** Domain Integrity constraints: Not null, Check Entity Integrity constraints: Unique, Primary key, Referential Integrity constraints: Foreign key, referenced key, Group by, Having and Order by clause , concept of sub queries.	10	20%
5	**Entity Relationship Diagram :** Entity types, Entity Sets, Attributes and keys, Relationship Types, Relationship sets, Weak entity Types, Refining the ER diagram for company Database, Entity Relationship Diagram, Subclasses, Super Classes, Inheritance Specialization and Generalization.	08	20%

Continuous Assessment:

Sr. No.	Active Learning Activities	Marks
1	**Database Blockbusters :** Prepare a video in a group of four students for different database objects and upload it on Moodle.	10
2	**Database Architect's Canvas :** Prepare charts for database architecture, E – R Model, Relational algebra etc. for given definitions and upload it on moodle	10
3	**Real-world Database Case Studies:** Students have to prepare case studies that highlight how major organizations use databases for their operations and upload it on moodle.	10
4	**Assignment :** Assignment of 10 questions will be given to Students who have to upload the solved assignment on the moodle.	10
5	**Attendance**	10
	Total	50

Suggested Specification table with Marks (Theory):75

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	35 %	45 %	10 %	10 %	00 %	00 %

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course students should be able to :	
CO1	Recognize the various elements of Database Management Systems.
CO2	identify the entities and their relations and draw an E-R diagram and design database applying normalization.
CO3	solve the given problem using Relational Algebra, Relational Calculus, SQL and PL/SQL.
CO4	apply and relate the concepts of transaction, concurrency control, recovery and security in database.
CO5	recognize the purpose of query processing, optimization and demonstrate the SQL query evaluation.

List of Practical :

Sr. No.	Descriptions	Unit No.	Hrs
1	Create 2 tables of students and employees with 5 fields and store actual data in the table.	3	02
2	Implement SQL queries to perform various DDL Commands. (Create minimum 5 tables with different data types and operate upon them)	3	02
3	Implement SQL queries to perform various DML Commands. (Insert minimum10 rows using different insert methods, edit and remove data using update and delete commands).	3	02
4	Retrieve data using SELECT command and various SQL operators	3	02
5	Implement SQL queries using Date functions like add-months, months-between, round, next day, truncate etc	3	02
6	Implement SQL queries using Numeric functions like abs, ceil, power, mod, round, trunc , sqrt etc.	3	02
7	Implement SQL queries and Character Functions like initcap, lower, upper, rtrim, replace, substring, instr etc.	3	02
8	Implement SQL queries using Conversion Functions like to- char, to-date, to-number.	3	02
9	Implement SQL queries using Group functions like Avg, Min ,Max, Sum, Count, Decode etc.	3	02
10	Retrieve data from multiple tables using Sub queries (Multiple, Correlated) (write minimum 3 level sub query)	3	02
11	Implement Practical-1 again with Domain Integrity, Entity Integrity.	3	02
12	Implement Practical-1 again with Referential Integrity constraints.	4	02
13	Retrieve data from multiple tables using Sub queries (Multiple, Correlated)	4	02
14	Draw E-R Diagram of the given problem statements.	5	02
		Total	28

Instructional Method:

The course delivery method will depend upon the requirement of content and the needs of students. The teacher, in addition to conventional teaching methods by black board, may also use any tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory.

The internal evaluation will be done on the basis of Active Learning Assignment.

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in the laboratory.

Reference Books:

[1] SQL -   Bayross , Ivan
[2] Database Systems Concepts, design and Applications 2/e - Singh, S.K.
[3] An Introduction to Database Systems - Date, C. J.
[4] Database System Concepts, - Korth , Henry