Syllabus for First Year M.Sc. (CA&IT)
Semester-II

[Five Years' (Full-time) M.Sc. (CA&IT) Integrated Degree Course]

Offered in

K. S. School of Business Management and Information Technology

Gujarat University

2023–2024

As per

NEP2020 CURRICULUM AND CREDIT FRAMEWORK FOR UNDER GRADUATE PROGRAMMES, UGC

&

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of

Education Department, Govt. of Gujarat

Semester-II

(B.Sc.(CA&IT)Programme)

MINOR

Gujarat University

K. S. School of Business Management and Information Technology
[Five Years' (Full – Time) M.Sc. (CA&IT) Integrated Degree Course]
First Year M.Sc. (CA&IT) (Semester - II)

Course Name: Fundamental of Database Management System-Theory

Course Code: DSC-M- IMSCIT-123T

Course Credit: 2

Course Outcomes:

After learning the course, the students should be able:

- Evaluate business information problem and find the requirements of a problem in terms of data.
- Understand the uses the database schema and need for normalization.
- Design the database schema with the use of appropriate data types for storage of data in database.
- Use different types of physical implementation of database
- Use database for concurrent use.
- Backup data from database.

Contents:

Unit No.	Course Content	Hours	Credits
1	**Concept of DBMS:** Database approach- Characteristics, & Application, Advantages of DBMS, Database Architecture - Data Models, Schemas, and Instances, Data Independence, Data Modeling, Levels of abstraction, file organization, index structures for files. Entity Relationship Model: Basic concepts, Design process, constraints, Keys, Design issues, E-R diagrams, weak entity sets, extended E-R features – generalization, specialization, Aggregation. **The Relational Database Model:** Functional Dependency – definition, Trivial and non-trivial FD, closure of FD set closure of attributes, irreducible set of FD.	**15**	**1**
2	**Normalization** – 1Normal Form, 2 Normal Form , 3 Normal Form , Boyce Codd Normal Form . Transaction Management: - Transaction Concepts, properties, states, implementations of Atomicity and Durability, Concurrent Executions, Serializability, and Recoverability **SQL Concepts:** Basics of SQL, DDL, DML, DCL, structure – creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, IN operator, Functions - aggregate functions, Built-in functions – numeric, date, string functions, set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All, view and its types. Transaction control commands – Commit, Rollback, Savepoint.	**15**	**1**

Reference Books:

1. Database System Concept
   By Silberschatz, Korth, Sudarshan, McGraw Hill, Fifth Edition
2. Database Management System
   By G. K. Gupta Tata McGraw Hill publication
3. SQL, PL/SQL The programming language of Oracle
   By Ivan Bayross BPB Publication 3rd Revised Edition.
4. Understanding SQL
   By Martin Gruber, BPB

Accomplishments of the student after completing the Course:

After completion of this course Student would be able to

- Understand the fundamental concepts of databases and the advantages of using a Database Management System (DBMS).
- Master the design process and constraints of the Entity-Relationship Model (E-R).
- Grasp the concept of Functional Dependency (FD) and its types.
- Implement normalization techniques, including 1NF, 2NF, 3NF, and BCNF.
- Demonstrate proficiency in SQL including DDL, DML, DCL. Utilize SQL for table creation, alteration, and defining constraints (e.g., primary key, foreign key).
- Apply SQL functions, aggregate functions, and handle set operations, sub-queries.
- Understand and work with GROUP BY, HAVING, ORDER BY, JOINs operations, as well as Exist, Any, All, views, and their types.

Gujarat University

K. S. School of Business Management and Information Technology
[Five Years' (Full – Time) M.Sc. (CA&IT) Integrated Degree Course]
First Year M.Sc. (CA&IT) (Semester - II)

Course Name: Fundamental of Database Management System-Practical

Course Code: DSC-M- IMSCIT-123P

Course Credit: 2

Course Outcomes:

After learning the course, the students should be able:

- Database creation, querying, and data manipulation.
- Importing, exporting, viewing, and sorting data.
- Removing duplicates and performing delete/update operations.
- Advanced SQL topics: sub queries, joins, triggers.
- Proficiency in cursor management and error handling.
- Creating procedures, functions, and packages.
- Comprehensive understanding of SQL-based database management.

Contents:

Unit No.	Course Content	Hours	Credits
1	**Concepts of SQL:** **SQL:** concepts and tools, the generic SQL Sentence Construct, DDL command (create, alter, drop, rename, truncate) **Data Constraints** 1. Defining integrity constraints in the alter table command 2. Dropping integrity constraints in the alter table command 3. Default Value Concept **Insertion of Data into tables** 1. Inserting of data into a table 2. Inserting of data into a table from another table **Viewing data in the tables** 1. View all rows and columns 2. Selected columns and all rows 3. Select rows and all columns Selected columns and selected rows **Elimination of duplicates from the select statement** **Sorting of data in a table** **Delete Operations** 1. Removing all rows 2. Removal of a specified row(s) **Update Operations** 1. Updating of all rows 2. Updating records conditionally	**30**	**1**

2	**Tables and Joins:** **Modifying the structure of tables** 1. Adding new columns 2. Modifying existing columns **Renaming Tables** **Destroying Tables** **Operators (Arithmetic & Logical Operators)** **Range Searching** **Pattern Matching** **Column Alias** **Built-In Functions (Aggregate, Scalar, Date and Date Conversion)** **Grouping Data from tables** 1. Using the WHERE clause with grouped data 2. Using the HAVING clause with grouped data **Comparison of WHERE and HAVING** **Sub queries** **Joins** 1. Inner Join, Self-Join, Outer Joins, Full Joins **Union, Intersect and Minus Clause** **View** **Sequence**	**30**	**1**

Reference Books:

1. SQL for Microsoft Access
   By Cecelia L. Allison, 2008
2. MS Access 2019
   By David murray 2019
3. SQL, PL/SQL The programming language of Oracle
   By Ivan Bayross, BPB Publication 3rd Revised Edition.
4. SQL/PLSQL for Oracle 9i
   By P.S. Deshpande, Dreamtech Press

Accomplishments of the student after completing the Course:

After completion of this course Student would be able to

- The course covers SQL essentials, including DDL commands, data constraints, insertion, viewing, and manipulation operations. Students learn integrity constraints, default values, and deletion and update techniques.
- They gain proficiency in sorting, eliminating duplicates, and utilizing arithmetic and logical operators. Advanced topics like sub queries, joins, and specialized clauses such as Union are explored.
- By course end, students adeptly manage databases using SQL, handling tasks like table modification, column manipulation, and data grouping.