

GUJARAT TECHNOLOGICAL UNIVERSITY

INSTRUMENTATION AND CONTROL (APPLIED INSTRUMENTATION) (03)

DATABASE MANAGEMENT SYSTEM

SUBJECT CODE: 2720316

Semester-II

Type of course: Major Elective-III

Prerequisite:

- (1) Elementary knowledge about computers including some experience using UNIX or Windows.
- (2) Computer Programming & Utilization

Rationale:

A database management system (DBMS) is designed to manage a large body of information. Data management involves both defining structures for storing information and providing mechanisms for manipulating the information.

Examples of the use of database systems include airline reservation systems, company payroll and employee information systems, banking systems, credit card processing systems, and sales and order tracking systems. A major purpose of a database system is to provide users with an abstract view of the data. That is, the system hides certain details of how the data are stored and maintained. Thereby, data can be stored in complex data structures that permit efficient retrieval, yet users see a simplified and easy-to-use view of the data. The lowest level of abstraction, the physical level, describes how the data are actually stored and details the data structures. The next-higher level of abstraction, the logical level, describes what data are stored, and what relationships exist among those data. The highest level of abstraction, the view level, describes parts of the database that are relevant to each user; application programs used to access a database form part of the view level.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
			ESE (E)	PA (M)	ESE (V)		PA (I)			
ESE	OEP	PA			RP					
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Introductory concepts of DBMS : Introduction and applications of DBMS, Purpose of data base, View of Data, Data Models, Database Languages, Database Users and Administrator, Database System Structure	6	10%
2	Relational Model: Structure of Relational Databases, The Relational Algebra-Fundamental operators and syntax, Extended Relational Algebra Operations, Modification of the Database, Views, The Tuple Relational Calculus, The Domain Relational Calculus	6	10%

3	Entity-Relational Model: Basic Concepts, Constraints, Keys, Design Issues, Entity-Relationship Diagram, Weak Entity Sets, Extended E-R Features, Design of an E-R Features	8	20%
4	Relational Database Design: First Normal Form, Pitfalls in Relational Database Design, Functional Dependencies, Decomposition, Boyce-Codd Normal Form, Third Normal Form, Fourth Normal Form	6	15%
5	SQL Concepts : Basics of SQL, DDL,DML,DCL, structure – creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, IN operator,	10	25%
6	SQL: 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.	10	20%

Reference Books:

1. Database System Concepts, Abraham Silberschatz, Henry F. Korth & S. Sudarshan, McGraw Hill.
2. SQL-PL/SQL by Ivan bayross
3. An introduction to Database Systems, C J Date, Addition-Wesley.
4. Understanding SQL by Martin Gruber, BPB

Course Outcome: After learning the course the students should be able to:

1. Evaluate business information problem and find the requirements of a problem in terms of data.
2. Understand the uses the database schema and need for normalization.
3. Design the database schema with the use of appropriate data types for storage of data in database.
4. Use different types of physical implementation of database.
5. Understand Data base management system, its characteristics, applications and advantages.
6. Illustrate ER model using ER diagrams for creating a conceptual design
7. Model a query using Relational algebra and Relational calculus

List of Tutorials:

Students have to solve queries based on the syllabus on any SQL/PLSQL supporting software. (e.g. Oracle, SQL Server, MySQL)

Major Equipments: Computer Lab

List of Software/Learning Websites:

1. DBMS: <http://nptel.iitm.ac.in/video.php?subjectId=106106093>
2. SQL Plus Tutorial: <http://holowczak.com/oracle-sqlplus-tutorial/>
3. Database Tutorials: <http://www.roseindia.net/programming-tutorial/Database-Tutorials>
4. SQL Basic Concepts: <http://www.w3schools.com/sql/>
5. SQL Tutorial : <http://beginner-sql-tutorial.com/sql.htm>

Review Presentation(RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry

portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.