PARUL UNIVERSITY - Faculty of IT & Computer Science

Department of Computer Application

SYLLABUS FOR 1st Sem MCA, M.Sc. (IT) PROGRAMME

Advanced Database Management Systems (05201107)

Type of Course: MCA, M.Sc. (IT)

Prerequisite: Knowledge of DBMS

Rationale: This course is intended to give students advanced concepts of Relational Database Management System, security aspects of databases and introduction to other databases. Also concepts and practical aspects of data manipulation using stored procedures and triggers will be given

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
				External		Internal			
Lect Hrs/ Week	Tut Hrs/ Week	Lab Hrs/ Week		T	P	T	CE	P	
3	0	2	4	60	30	20	20	20	150

Lect - Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P** - Practical, **CE** - CE, **T** - Theory, **P** - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	**Introduction to Databases**: **Basic Concepts:**Data, Database, Database systems, DBMS, Purpose and advantages of DBMS. **Data Models:**Introduction, Three level architecture, Various components of a DBMS. **Overview:** Parallel database, Distributed database, Object oriented database, Object Relational Database, Comparison of RDBMS, OODBMS and ORDBMS.	10%	5

2	**Relational Data Model and Database Design**: **Relational Structure:** Tables, Rows, Columns, Entity sets, Attributes, Types of entities, Relationships and types of relationships, Database modelling using entity and relationships. **Keys:**Super key, Candidate keys, Primary key, Entity integrity constraints, Referential integrity constraints. **Indexing:** Types of single level ordered indexes, Primary index, Cluster index, Secondary index, and Multilevel index. **DB Design:** Database design process, Functional dependencies, Normalization.	15%	8
3	**Query Language and Database operations**: Overview of SQL, Basic and Advanced queries in SQL, Aggregation, Views in SQL, Introduction of NoSQL, Relational Algebra and Calculus – basic and advanced operators**.**	10%	6
4	**PL/SQL, Cursor and Trigger**: Basic code structure, Variables, Conditional statements, Looping Structures, Cursor Operations, Triggers.	15%	7
5	**Stored Procedures**: Understanding the main features of stored procedures, stored procedure architecture, Advantages of using procedures. Stored procedures - functions, procedures and packages.	20%	8
6	**Database Transactions and Database Security**: Overview of Database Transactions, concurrency control, Deadlock Handling. Database security and its issues, Granting and Revoking privileges, Role based access control for multilevel security, Encryption and PKI, Challenges in database security.	20%	7
7	**Backup and Recovery in Database**: Database Backup and Recovery concepts, Database Backup and Recovery techniques, Current trends of database technologies.	10%	4

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Reference Books:

1. Database System Concepts
Silberschatz, Korth, Sudarshan; McGraw Hill Publication; 4th Edition

2. SQL, PL/SQL – The Programming Language
Ivan Bayross; BPB Publications
3. Database Management Systems
Raghu Ramakrishnan, Johannes Gehrke; McGraw Hill Publication
4. Fundamentals of Database Systems
Ramesh Elmasari, Shamkant B. Navathe; Pearson Education

Course Outcome:

After Learning the course the students shall be able to:

1. identify significance of object relational database management system.
2. apply programming construct such as stored procedure, stored function, cursor and triggers.
3. define different types of index and database security mechanism.
4. describe database recovery techniques.
5. discuss emerging database technology such as mobile database, multimedia database and geographical information system database.