GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM
COURSE TITLE: DATABASE MANAGEMENT
(Code: 3341605)

Diploma Programme in which this course is offered	Semester in which offered
Information Technology	4th semester

1. RATIONALE

Data management course prepares student to design data base using various models, sql commands, techniques and operation which are introduced in this course. This creates strong foundation for application of data design. Student will be able to learn basic need of database in industry, the various noramalization concepts and queries performance.

2. COMPETENCY

The course content should be taught and implemented with the aim to develop different types of skills so that students are able to acquire following competency:

- **Develop simple data base management system and retrive the required information from database.**

3. COURSE OUTCOMES

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

i. Explain Database concept and its utilities.
ii. Uses of Structure Query Language(SQL) commands.
iii. Perform Query operations.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	200
3	0	4	7	70	30	40	60	

Legends: L - Lecture; **T -** Tutorial/Teacher Guided Student Activity; **P -** Practical; **C -** Credit; **ESE** - End Semester Examination; **PA** - Progressive Assessment

5. COURSE DETAIL

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – I Data Management Concepts	1a. Describe the basic aspects of Data base Management System	1.1 Introduction 1.1.1 Data and Information 1.1.2 Metadata 1.1.3 Data items or fields 1.1.4 Records 1.1.5 Files 1.1.6 Data Dictionary 1.1.7 Database 1.2 Purpose of Database System 1.3 File oriented System versus database system 1.4 Application of DBMS 1.5 Database Administrator 1.5.1 Roles of DBA 1.5.2 Responsibilities of DBA
	1b. Explain concepts of data abstration 1c. Describe various types of database Architecture	1.6 Schema,Sub-Schema,Instances 1.7 Data Abstraction 1.7.1 Internal Level 1.7.2 Conceptual Level 1.7.3 External Level 1.8 Database Architecture 1.8.1 Centralized 1.8.2 Client-server 1.8.3 Parallel 1.8.4 Distributed
Unit – II **Integrity Constraints and Ms-Access**	2.a Describe various database constraints	2.1 Need of Constraints 2.2 Domain Integrity constraints 2.2.1 Not null 2.2.2 Check 2.3 Entity Integrity constraints 2.3.1 Unique 2.3.2 Primary key 2.4 Referential integrity Constraints 2.4.1 Foreign key 2.4.2 Reference key

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
	2b. Create database for an application using MS- Access 2c. Manage tables and set relations	2.5 Introduction to MS Access 2.6 Creation of Data sheet 2.7 Field and Records 2.8 Table 2.9 Queries 2.10 Realtions
Unit – III **Relational Algebra and E-R Model**	3a. Explain Relational Algebra and its notations in relation to database management	3.1 Algebra 3.2 Queries 3.3 Domains 3.4 Relations 3.5 Operator and Syntax
	3b. Explain the concept of E-R diagrams 3c. Design E –R diagrams for an application.	3.6 Basic concepts of E-R 3.6.1 Entity 3.6.2 Relationship 3.6.3 Attributes (single,composite,multivalued,Derive) 3.7 Mapping cardinality 3.8 Keys 3.8.1 Primary 3.8.2 Foreign 3.8.3 Super 3.8.4 Candidate 3.9 Design issues 3.10 weak entity set 3.11 E-R Diagrams 3.12 Features 3.12.1 generalization 3.12.2 specialization 3.12.3 aggregation
Unit – IV **Structure Query Language**	4a. Retrieve data/information using Structured Query Language	4.1 SQL Data types 4.2 DDL Commands 4.2.1 create 4.2.2 alter 4.2.3 truncate 4.2.4 drop 4.3 DML Commands 4.3.1 insert 4.3.2 select

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
		4.3.3 update 4.3.4 delete 4.4 Privilege command 4.4.1 grant 4.4.2 revoke 4.5 SQL views
	4.b Use SQL Functions for different operations 4.c Write queries to use various SQL functions.	4.6 Single row function 4.7 Date functions 4.8 Numeric functions 4.9 Character function 4.10 Conversion function 4.11 Miscellaneous function 4.12 Group function
	4.c Use SQL complex queries and Sub queries to retrieve data	4.13 Operators 4.14 Arithmetic 4.15 Comparision 4.16 Logical Group by 4.17 Having and order by clause 4.18 Set operators 4.18.1 Union 4.18.2 union all 4.18.3 intersect 4.18.4 minus 4.19 Joins 4.19.1 simple join 4.19.2 equi join 4.19.3 non equi join 4.19.4 self join 4.19.5 outer join
Unit – V **Relational Database design**	5a Describe the concept of Normalization of a database 5b Design database table at different levels of normalizations.	5.1 Functional Dependencies 5.2 Importance of Normalization 5.3 Different Normalization 5.3.1 1NF 5.3.2 2NF 5.3.3 BCNF 5.3.4 3NF 5.4 Comparision of BCNF and 3NF

6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Data Management Concepts	08	2	4	4	10
II	Integrity Constraints and Ms-Access	08	2	4	6	12
III	Relational Algebra and E-R Model	08	4	6	6	16
IV	Structure Query Language	12	4	7	8	19
V	Relational Database Design	06	4	3	6	13
Total		**42**	**16**	**24**	**30**	**70**

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

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.

7. SUGGESTED LIST OF EXERCISES/PRACTICAL

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills **(outcomes in psychomotor and affective domain)** so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

Note*: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of* ***Course Outcomes*** *related to affective domain. Thus over all development of* ***Programme Outcomes (****as given in a common list at the beginning of curriculum document for this programme) would be assured.*

Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.

Sr. No.	Unit No.	Practical/Exercise (outcomes in Psychomotor Domain)	Apprx. Hrs. Required
1	II	Create MS Access database having two tables, insert 10 records in it and show all the records of it.	2
2		Create MS Access database having three table show the relation among them,perform insert delete operation in it.	2
3		Create MS Access database having multiple table change the size and type of a field.and show the updated records	2
4		Create MS Access database ,use various queries on it to modify.	2

Sr. No.	Unit No.	Practical/Exercise (outcomes in Psychomotor Domain)	Apprx. Hrs. Required
5		Create MS Access database using access ,use multiple table join related tables.	4
6		Create access database,sort the data on specific field.	2
7	III	Write sql query to create table and insert 10 records.	2
8		Write sql query to update the records on specific field.	2
9		Write sql query to delete the particular table.	2
10		Write sql queries to use various date functions.	2
11		Write sql queries to use various numeric functions	2
12		Write sql queries to use various character functions	2
13		Write sql queries to use various operators.	2
14		Write sql queries to use various converision functions	2
15		Write sql queries to use various group functions	2
16		Write SQL queries using Group by, Having and Order by clause	4
17	IV	Write SQL queries to create a table	2
18		Write SQL queries to insert a value in to a table	2
19		Write SQL queries to show the record in the table	2
20		Write SQL queries to show the one field of the table	2
21		. Write SQL queries to delete the record in the table	2
22	V	Write SQL queries to show some records.	2
23		Write SQL queries using Set operators.	2
24		Write SQL queries using join operation.	2
25		Write SQL queries to retrieve data from maultiple tables.	2
26		Write SQL queries to show all the records and modify some data	2
Total Hours			56

8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like:

i. Seminar with Power point Presentations.
ii. Design a Model for any real time system.

9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

Prepared database like student information , banking, library, insurance etc.

10. SUGGESTED LEARNING RESOURCES

(A) List of Books

Sr. No.	Title of Books	Author	Publication
1	Database System Concepts	Henry Korth	MGH
2	Microsoft Access Fundamentls	Rudy LeCorps	RGL Learning
3	Sql/ Pl-SQL	Ivan Bayross	BPB
4	An Introduction to Database	C. J. Date	Pearson

	Systems		Education
5	Beginners Guide	ORACLE PRESS	THM
6	Oracle – The complete reference	ORACLE PRESS	TMH

(B) List of Major Equipment with Major Specifications.

Hardware : Desktop Computer P-IV processor or higher

Software : Microsoft 2003 /any higher version
Oracle, SQL Server, MySQL

(C) List of Learning Websites.

i. Ms-Access Tutorial : http://www.quackit.com/microsoft_access/tutorial/
ii. SQL Basic Concepts: http://www.w3schools.com/sql/
iii. SQL Tutorial : http://beginner-sql-tutorial.com/sql.htm
iv. DBMS:http://nptel.iitm.ac.in/video.php?subjectId=106106093

11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof. Priti.N.Parikh ,** Lecturer (I.T), Government Polytechnic,Ahmedabad
- **Prof. Darshana Trivedi**, Lecturer (I.T), R.C.T.I Ahmedabad.

Coordinator and Faculty Members from NITTTR Bhopal

- **Dr.Shailendra Singh**, HOD, Department of Computer Engineering and Applications.
- **Dr.K.J.Mathai**, Associate Professor, Department of Computer Engineering and Applications.