

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM
Course Title: DATA MANAGEMENT
(Code: 3341605)

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

1. RATIONALE

Data management course prepares student to design Data base using various models, sql commands, techniques and operation introduced in this subject. 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:

- **To aware with Data Management and retrieve the required information from database.**

3. COURSE OUTCOMES

- **Understand Database concept and its utilities.**
- **Uses of Structure Query Language(SQL) commands.**
- **Perform Query operation and Normalization of database.**

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	
3	0	4	7	70	30	40	60	200

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

5. COURSE DETAILS

Unit	Major Learning Outcomes	Topics and Sub-topics
Unit – I Data Management Concepts	1a. Introduction of Data Management	1.1 Introduction <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 1.5.1 Roles of DBA 1.5.2 Responsibilities of DBA
	1b. Database Architecture	1.6 Schema,Sub-Schema,Instances 1.7 Data Abstraction <ul style="list-style-type: none"> 1.7.1 Internal Level 1.7.2 Conceptual Level 1.7.3 External Level 1.8 Database Architecture <ul style="list-style-type: none"> 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 Concept of Constraints	2.1 Need of Constraints 2.2 Domain Integrity constraints <ul style="list-style-type: none"> 2.2.1 Not null 2.2.2 Check 2.3 Entity Integrity constraints <ul style="list-style-type: none"> 2.3.1 Unique 2.3.2 Primary key 2.4 Referential integrity Constraints <ul style="list-style-type: none"> 2.4.1 Foreign key 2.4.2 Reference key
	2b. Understanding MS- Access	2.5 Introduction to MS Access 2.6 Creation of Data sheet

Unit	Major Learning Outcomes	Topics and Sub-topics
		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	3.1 Algebra 3.2 Queries 3.3 Domains 3.4 Relations 3.5 Operator and Syntax
	3b. Design E –R model	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. SQL Commands	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 4.3.3 update 4.3.4 delete

Unit	Major Learning Outcomes	Topics and Sub-topics
		4.4 Privilege command 4.4.1 grant 4.4.2 revoke 4.5 SQL views
	4.b SQL Function	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 SQL Queries and Sub Queries	4.13 Operators 4.14 Arithmetic 4.15 Comparison 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 Normalization of database design	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 Comparison 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	14
II	Integrity Constraints and Ms-Access	08	2	4	6	12
III	Relational Algebra and E-R Model	08	4	6	6	14
IV	Structure Query Language	12	4	5	8	18
V	Relational Database Design	06	4	4	6	12
Total		42	16	23	30	70

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

Note: This specification table shall be treated as only general guideline for students and teachers. The actual distribution of marks in the question paper may vary 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 practical skills (**Course 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 Course Outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

Sr. No.	Unit No.	Practical/Exercise	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
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
8	III	Write sql query to create table and insert 10 records.	2
9		Write sql query to update the records on specific field.	2
10		Write sql query to delete the particular table.	2
12		Write sql queries to use various date functions.	2
13		Write sql queries to use various numeric functions	2
14		Write sql queries to use various character functions	2
15		Write sql queries to use various operators.	2
16		Write sql queries to use various converision functions	2
17		Write sql queries to use various group functions	2
18		Write SQL queries using Group by, Having and Order by clause	4
19	IV	Write SQL queries to show some records.	2
20		Write SQL queries using Set operators.	2
21		Write SQL queries using join operation.	2
22		Write SQL queries to retrieve data from maultiple tables.	2
23		Write SQL queries to show all the records and modify some data.	2
24	V	Create table should be in 1NF.	2
25		Design the tables should be in 2NF.	2
26		Design the tables should be in 3NF.	2
27		Write queries to create database and arrange it in normalized form	4
		Total	56

8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like:

- i. Power point Presentation
- 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 Fundamentals	Rudy LeCorps	RGL Learning
3	Sql/ Pl-SQL	Ivan Bayross	BPB
4	An Introduction to Database Systems	C. J. Date	Pearson 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.

- 1) Ms-Access Tutorial : http://www.quackit.com/microsoft_access/tutorial/
- 2) SQL Basic Concepts: <http://www.w3schools.com/sql/>
- 3) SQL Tutorial : <http://beginner-sql-tutorial.com/sql.htm>
- 4) DBMS:<http://nptel.iitm.ac.in/video.php?subjectId=106106093>

11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

1. Miss. Priti.N.Parikh , Lecturer (I.T), Government Polytechnic,Ahmedabad
2. Miss. Darshana Trivedi, Lecturer (I.T), R.C.T.I Ahmedabad.

Coordinator and Faculty Members from NITTTR Bhopal