C. U. SHAH UNIVERSITY

Faculty of Computer Science

Master of Science (Information Technology) - (M.Sc.I.T.)

(2 years – Four Semester Full Time Course)

Semester: I Subject Code: MSIT101 Name: ADVANCED PROCEDURAL LANGUAGE & DATA CONCEPT

Sr. No.	Subject Code	Name of the Subject	Teaching Scheme (Hours)				Evaluation Scheme								
							Theory					Practical (Marks)			
							Sessional Exam		University Exam		Total				
			Th	Tu	Pr	Total	Marks	Hrs	Marks	Hrs		Pr/ Viva	TW	Total	Total
1	MSIT101	ADVANCED PROCEDURAL LANGUAGE & DATA CONCEPT	4	1	4	9	30	1.5	70	2.5	100	80	20	100	**200**

Objectives:

- The aim of this course is to introduce to the students the rudiments of structured programming using C language.
- Students will become familiar with problem solving techniques and algorithm development.

Prerequisites:

- Computer Literacy, Knowledge of Algorithm and Flowchart.

Course Outline:

SNo.	Course Contents	Number of Hours
1	**Introduction of C** Tokens, Operators and Expressions, Operators precedence & associatively **Decision making & Branching** If, if-else, nested if-else, switch-case, For, Do-While, While Loop	06
2	**Arrays** Introduction, one dimensional array, two dimensional arrays and muti-dimensional array,	04

	array to string	
3	**String Handling** Overview & Declaration of string, String-handling functions, String as array	04
4	**Structures** Declaration, usage of structure, nested, structures, Union and its usage, structure to array	04
5	**Function** Definition, using functions, recursion, command line arguments	06
6	**Pointers** Declaring and initializing pointers, Array and Pointers, Pointers, and strings, Pointer to Pointer, Pointers and functions	06
7	**Introduction and Classification of Data Structure** Primitive Data Structure, Non-Primitive Data Structure	03
8	**Stack** Introduction, stack, Operations on stack, application of stack	05
9	**Queue** Introduction, simple queue, Circular queue, double ended queue, Priorities queue	05
10	**Linked Lists** Overview of Linked Linear Lists , Circularly Linked Linear Lists , Doubly Linked, Linear Lists	07
11	**Sorting** Introduction, Bubble sort, Insertion sort, Selection sort, Merge Sort	03
	Total Lecture	**60**

List of Practical:

SNo.	Course Contents
1	W.A.P to add, multiply, divide two integer and float numbers, W.A.P to accept no of days and print year, month and remaining days
2	W.A.P to check whether entered number is prime or not, W.A.P to check whether entered number is odd or even
3	Print Series 2,4,16,...,n*n using shorthand operator and while loop
4	W.A.P to generate Fibonacci number, W.A.Pto find a factorial of entered number
5	W.A.P to print multiplication table
6	W.A.P to print all the numbers and sum of all the integers that are greater than 100 and less than 200 and divisible by 7
7	W.A.P to find roots of equation ax2+bx+c=0
8	W.A.P to print following output

	a b c d e a b c d a b c a b a W.A.P to print the following output. 1 2 3 4 5 6 7 8 9 10 . . 71.....91
9	W.A.P to find the maximum & minimum value from entered array
10	W.A.P to sort given array into ascending & descending order
11	Write a program to add, subtract & multiply two matrices
12	Write a program that will read text and count all occurrence of a particular word, Write a program that append one string to another string
13	Write a program to use recursive calls to evaluate f(x) = x() - x(3)/3! + x(5)/5! - x(7)/7!
14	Write in a program declare the following Structure members: Name, code, age, weight, height. Read all the members of the structure for 100 persons and the find the list of persons with all related data whose weight >50 and height >40 and print the same with the suitable format and title
15	W.A. P to reverse a string using pointer
16	W.A.P to perform the following operation on a stack (1) push (2) pop (3) peep
17	W.A.P to perform the following operation on a simple queue using an array & pointer (1) insert an element (2) delete an element (3) display an element
18	W.A.P to perform the following operation on a circular queue.
19	W.A.P to implement Double ended queue(Input Restricted / Output Restricted)
20	W.A.P to create a sorted singly linked list.
21	W.A.P to sort a given list using (1) Insertion Sort (2) Bubble Sort (3) Selection Sort (4) Merge Sort

Learning Outcomes:

- After completion of the course students should become reasonably good at problem solving and algorithm development. They would become capable of solving problems using computers through C programming language.

Teaching & Learning Methodology:

- Using Whiteboard & Multimedia or OHP

Books Recommended:

Text Books:

- "Programming in ANSI C" By E. Balaguruswami
- " Classic Data Structures ", Debasis Samanta, PHI

Reference Books:

- "Programming in C", by Pradip Dey & Manas Ghosh, Publisher – Oxford
- "Data Structure Using C and C++", Y kanitkar, PHI
- "Let us C", by Yashwant Kanitkar, Publisher – BPB Publication

C. U. SHAH UNIVERSITY

Faculty of Computer Science

Master of Science (Information Technology) - (M.Sc.I.T.)

(2 years – Four Semester Full Time Course)

Semester: I **Subject Code: MSIT102** **Name** DATABASE MANAGEMENT SYSTEM CONCEPTS & TOOLS

Sr. No.	Subject Code	Name of the Subject	Teaching Scheme (Hours)				Evaluation Scheme								
							Theory					Practical (Marks)			
							Sessional Exam		University Exam		Total				
			Th	Tu	Pr	Total	Marks	Hrs	Marks	Hrs		Pr/ Viva	TW	Total	Total
1	MSIT102	DATABASE MANAGEMENT SYSTEM CONCEPTS & TOOLS	4	1	4	9	30	1.5	70	2.5	100	80	20	100	**200**

Objectives:

- This course is designed to make student familiar with the fundamental concepts of DBMS for designing and implementing database systems by using the tools like SQL.

Prerequisites:

- Basic knowledge of working with computer.

Course Outline:

Sr. No.	Course Contents	Number of Hours
1	**Database Concepts and Architecture** Preliminary concepts: data, database, database systems, database management systems, Components of database system, Functions of DBMS Characteristics and elements of database system Schema, Instance and Database State Database Applications, Purpose and Advantages of Database Management System	12

	(over file systems), View of Data (Data Abstraction, Data Models) Data Storage and Querying (Components, Storage Manager, Query Processor) Database Architecture (Client/Server and Three Tier Architecture) Database User and Administrators	
2	**Features of Entity Relationship Diagram** Entity Relational Model (Entity Sets, Relationship Sets, Attributes), Constraints (Mapping Cardinalities, Keys, Participation Constraints), Entity Relationship Diagram, Weak Entity Set, Extended E-R Features (Generalization, Specialization and Aggregation), E-R Notations Examples of ERD	10
3	**Relational Model and Database Design** Relational structure – tables (relations), rows (tuples), domains, columns (attributes) Database design process, Anomalies in a database Functional Dependencies (Definition, Types of Functional Dependency) Decomposition: (Definition, Loosy Decomposition, Lossless join decomposition, Dependency preserving decomposition) Closure set of FD, Canonical Cover Normalization	12
4	**Introduction to SQL** Basic Data Types of ORACLE Data Definition Language (DDL) Data Manipulation Language (DML) Data Control Language (DCL) Transaction Control Language (TCL) Data Constraints, Inbuilt Functions Subqueries, Join, Indexes, Views, Sequences, Synonyms, Set Operators ORACLE Utility – Import, Export	14
5	**Relational Algebra** Native Relational Operations (Selection, Projection, Join, Difference) Additional Operations (Rename, Assignment, Generalized Projection, Aggregation) Relational Algebra Examples	12
	Total hours	**60**

List of Practical:

Sr. No.	Course Contents
1	➢ **Create the following tables:** **1. Create LOCATION Table with columns Location_Id, Regional_Group.** **Constraints on LOCATION table:** Location_Id Primary Key. **2. Insert the following records into the table LOCATION:** LOCATION_ID REGIONAL_GROUP ---------- ---------- 122 NEW YORK 123 DALLAS 124 CHICAGO 167 BOSTON **3. Create DEPARTMENT Table with columns Department_Id, Name, Location_ID.** **Constraints on DEPARTMENT table:** Department_Id Primary Key, Location_Id references LOCATION table. **4. Insert the following records into DEPARTMENT table:** DEPRATMEMT_ID NAME LOCATION_ID ---------- ---------- ---------- 10 ACCOUNTING 122 20 RESEARCH 124 30 SALES 123 40 OPERATIONS 167 **5. Create JOB Table with columns Job_Id, Funcation.** **Constraints on JOB table:** Job_ID Primary Key. **6. Insert the following records into JOB table:** JOB_ID FUNCTION ---------- ---------- 667 CLERK 668 STAFF 669 ANALYST 670 SALESPERSON 671 MANAGER 672 PRESIDENT

7. Create EMPLOYEE Table with columns Employee_Id, Last_Name, First_Name, Middle_Name, Job_Id, Manager_Id, Hire_Date, Salary, Comm, Department_ID.

Constraints on EMPLOYEE table: Employee_Id Primary Key, Last_Name NotNull, Department_Id references DEPARTMENT table.

8. Insert the following records into EMPLOYEE table:

EMPLOYEE_ID	LAST_NAME	FIRST_NAME	MIDDLE_NAME	JOB_ID	MANAGER_ID	HIRE_DATE	SALARY	COMM	DEPARTMENT_ID
7369	SMITH	JOHN	Q	667	7902	17-DEC-84	800	NULL	20
7499	ALLEN	KEVIN	J	670	7698	20-FEB-85	1600	300	30
7505	DOYLE	JEAN	K	671	7839	04-APR-85	2850	NULL	30
7506	DENNIS	LYNN	S	671	7839	15-MAY-85	2750	NULL	30
7507	BAKER	LESLIE	D	671	7839	10-JUN-85	2200	NULL	40
7521	WARK	CYNTHIA	D	670	7698	22-FEB-85	1250	500	30

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- **Perform the following queries on the tables given in Set no. 6:**

1. **List all job details.**
2. **List all the locations.**
3. **List out first name,last_name,salary, commission for all employees.**
4. **List out employee_id,last_name,department_id for all employees and**

	rename employee_id as "ID of the employee", last_name as "Name of the employee", department_id as "department ID". 5. List out the employee's annual salary with their names only. 6. List out the employees who are working in department 20. 7. List out the employees who are earning salary between 3000 and 4500. 8. List out the employees who are working in department 10 or 20. 9. List out the employees whose name starts with "S". 10. List out the employees whose name length is 4 and start with "S"
3	➢ Perform the following queries on the tables given in Set no. 6: 1. List out the employee id, last name in ascending order based on the employee id. 2. List out the employee id, name in descending order based on salary column. 3. List out the employee details according to their last_name in ascending order and salaries in descending order. 4. List out the employee details according to their last_name in ascending order and then on department_id in descending order. 5. How many employees who are working in different departments wise in the organization 6. List out the department wise maximum salary, minimum salary, average salary of the employees 7. List out the no. of employees for each month and year, in the ascending order based on the year, month. 8. List out the department id having at least four employees. 9. How many employees in January month. 10. Which is the department id, having greater than or equal to 3 employees joined in April 1985.
4	➢ Perform the following queries on the tables given in Set no. 6: 1. Display the employee who got the maximum salary. 2. Display the employees who are working in Sales department. 3. Display the employees who are working as "Clerk". 4. Find out no. of employees working in "Sales" department. 5. List our employees with their department names. 6. Display employees with their designations (jobs). 7. How many employees who are working in different departments and display with department name. 8. How many jobs in the organization with designations. 9. Display employee details with all departments. 10. List out the common jobs in Research and Accounting Departments in ascending order.

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➢ **Create the following tables:**

1. **Create STUDENT Table with fields rollno, name, class, birthdate**

Constraints on STUDENT table: rollno primary key and rollno must start with latter 'R'.

2. **Insert the following records into Student Table:**

ROLLNO	NAME	CLASS	BIRTHDATE
R1	Pritesh Patel	A	23-FEB-89
R2	Sugeet Patel	A	05-SEP-85
R3	Dipesh Patel	B	24-MAR-76
R4	Chandresh patel	B	17-APR-87
R5	Bhavin Jilvaani	A	25-DEC-75

3. **Create COURSE Table with fields courseno, coursename, max_marks, pass_marks**

Constraints on COURSE table: courseno primary key, check for max_mark>0, also check for pass_mark>0 and pass_marks<max_marks.

4. **Insert the following records into Course Table:**

COURSENO	COURSENAME	MAX_MARKS	PASS_MARKS
610001	FOP	90	40
610002	FOP Prac	90	40
610003	MATHS	90	40
610004	COMP ORG	90	40
610005	DBMSI	90	40
610006	SQL & PL/SQL	90	40
610007	ERFM	90	40

1. **Create SC Table with fields rollno, courseno, marks:**

Constraints on Sc table: marks must be greater than 0, rollno, courseno primary key, rollno references students and couseno references course.

2. **Insert the following records into SC Table:**

ROLLNO COURSENO MARKS

R3	610005	70	
R3	610001	70	
R3	610002	68	
R3	610003	58	
R3	610004	74	
R3	610006	59	
R3	610007	55	
R1	610001	80	
R1	610002	89	
R1	610003	78	
R1	610004	88	
R1	610005	76	
R1	610006	85	
R1	610007	90	
R2	610001	90	
R2	610002	85	
R2	610003	78	
R2	610004	75	
R2	610005	68	
R2	610006	59	
R2	610007	74	
R4	610001		75
R4	610002	45	
R4	610003	58	
R4	610004	68	
R4	610005	78	
R4	610006	62	
R4	610007	63	
R5	610001	70	
R5	610002	78	
R5	610003	52	
R5	610004	79	
R5	610005	85	
R5	610006	76	
R5	610007	80	

6	➢ **Perform the following queries on the tables given in Set no. 10:** **1. Add constraint that marks entered are between 0 to 100 only.** **2. While creating COURSE table, primary key constraint was forgotten. Add the primary key now.** **3. Display details of student where course is 'Data Base Management System'** **4. Select student names who have scored more than 70% in Computer Networks and have not failed in any subject.** **5. Select names and class of students whose names begin with 'A' or 'B'.** **6. Display average marks obtained by each student.** **7. Select all courses where passing marks are more than 30% of average maximum marks.** **8. Select the course where Second and third characters are 'AT'** **9. Display details of students born in 1975 or 1976.** **10. Find out the cousewise average marks from SC table.**
7	➢ **Perform the following miscellaneous queries:** **1. Add 15 days to current date.** **2. Add and subtract 5 months from current month.** **3. Calculate months between current months and '3-7-2008'** **4. Find last day of current month.** **5. How many days left in a current month?** **6. Find ASCII value of letter 'R'.** **7. Find name of all constraint based on particular table.** **8. Find difference between current date and specified date.** **9. Find username and userid from current login.** **10. Find the occurrence of 'or' in the string.**
8	➢ **Create the following tables:** **1. Create the table SCREEN with the fields (screen_id, location, seating_cap)** **Constraints on SCREEN table:** screen_id primary key, location not null, seating_cap not null, Screen_Id must start with S, location values must be either FF,SF or TF, seating_cap must be greater then 0. **2. Insert the following records into SC Table:**

SCREEN_ID		
S1	SF	400
S2	TF	350
S3	TF	250
S4	SF	300
S5	TF	170

3. **Create the table MOVIE with the fields (movie_id, movie_name, date_of_release)**

   Constraints on MOVIE table: movie_id primary key, movie_name unique, date_of_release not null.

4. **Insert the following records into the table MOVIE:**

MOVIE_ID		
M01	Star Wars III	11-SEP-09
M02	Oceans 13	10-JUL-09
M03	Armageddon	18-FEB-05
M04	Step up	27-SEP-02
M05	Terminator-3	25-OCT-05

5. **Create the table CURRENT1 with the fields (screen_id, movie_id, date_of_arrival, date_of_closure)**

   Constraints on CURRENT1 table: screen_id references SCREEN table, movie_id references MOVIE, date_of_arrival not null, date_of_closure not null, check for date_of_arrival<date_of_closure.

6. **Insert the following records into the table CURRENT1:**

SCREEN_ID	MOVIE_ID	DATE_OF_ARRIVAL	DATE_OF_CLOSURE
S1	M01	13-JUL-09	26-AUG-09
S2	M03	25-APR-04	03-MAY-04
S3	M02	05-JAN-09	25-FEB-09
S4	M04	16-MAR-09	20-APR-09
S5	M05	03-MAY-05	09-JUL-05

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➢ **Perform the following queries on the tables given in Set no. 13:**

1. **Get the name of movie which has run the longest in the multiplex so far.**
2. **Get the average duration of a movie on screen number 'S4'.**
3. **Get the details of movie that closed on date 24-november-2004.**
4. **Movie 'star wars III' was released in the 7th week of 2005. Find out the date of its release considering that a movie releases only on Friday.**
5. **Get the full outer join of the relations screen and current.**

10

➢ **Create the following tables:**

1. **Create the table DISTRIBUTOR with the fields (DNO, DNAME, DADDRESS, DPHONE)**

Constraints on table DISTRIBUTOR: dno primary key, dname not null.

2. **Insert the following records into the table DISTRIBUTOR**

DNO	DNAME	DADDR	DPHONE
D01	Hardik	Ode	9315462
D02	Dhaval	Anand	9325135
D03	AAAAOH	Baroda	9563154
D04	Mr. Talkative	Vasad	9321354
D05	Dipen	Thasara	9345432

3. **Create the table ITEM1 with the fields (ITEMNO, ITEMNAME, COLOR, WEIGHT)**

Constraints on table ITEM1: itemno primary key, itemname not null, check for weight>0

4. **Insert the following records into the table ITEM1:**

ITEMNO	ITEMNAME	COLOUR	WEIGHT
I01	Screw	Black	20
I02	Bolt	white	100
I03	Nut	red	50
I04	Hammer	green	75
I05	Washer	red	110
I06	Wire	Gray	37
I07	Nail	Green	46

5. Create the table DIST_ITEM with the fields (DNO, ITEMNO, QTY):

Constraints of table DIST_ITEM: dno references DISTRIBUTOR table, itemno references ITEM table

6. Insert the records into the table DIST_ITEM:

DNO	ITEMNO	QTY
--------	D01	
	I02	
	130	
D02	I01	500
D03	I05	420
D04	I03	320
D05	I06	160
D02	I04	190
D01	I07	462
D05	I01	256
D03	I04	315

11

- **Perform the following queries on the tables given in Set no. 15:**

1. **Add column CONTACT_PERSON to the distributor table with the not null constraint.**
2. **Create a view LONDON_DIST on DIST_ITEM which contains only those records where distributors are from London. Make sure that this condition is checked for every DML against this view.**
3. **Display detail of all those item that have never been supplied. Select * from item1 where itemno not in(select itemno from dist_item) no rows selected.**
4. **Delete all those items that have been sulpplied only once.**
5. **List the names of distributors who have an 'A' and also a 'B' somewhere in their names.**

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- **Perform the following queries on the tables given in Set no. 15:**

1. **Count the number of items having the same color but not having weight between 20 and 100**
2. **Display all those distributors who have supplied more than 1000 parts of the same type.**
3. **Display the average weight of items of same colour provided at least one items have that colour.**
4. **Display the position where a distributor name has an 'OH' in its spelling somewhere after the forth character.**

	5. Count the number of distributors who have a phone connection and are supplying item number 'I100'.
13	➢ **Perform the following queries on the tables given in Set no. 15:** **1. Create a view on the table in such a way that the view contains the distributor name, item name and the quantity supplied.** **2. List the name, address and phone number of distributors who have the same three digits in their number as 'Mr. Talkative'.** **3. List all distributor names who supply either item I01 or I07 and the quantity supplied is more than 100.** **4. Display the data of the top three heaviest ITEMS.** **5. Count the total quantity group by itemno.**
14	➢ **Create the following tables:** **1. Create the table WORKER with the fields (worker_id, name, wage_per_hour, specialized_in, manager_id)** **Constraints on table WORKER:** worker_id primary key, name not null, manager_id primary key, check for wage_per_hour>=0. **2. Insert the following records into the table WORKER:** WOR NAME WAGE_PER_HOUR SPECIALISED_IN MAN ------- ---------- ---------- ---------- ------- W01 Mr.Cacophonix 50 Polishing M01 W02 Dhaval 40 Polishing M02 W03 Dipen 35 Fitting M03 W04 Hardik 30 Marketing M04 W05 Jigar 55 Fitting M05 **3. Create the table JOB with the fields (job_id, type_of_job, status):** **4. Insert the following records into the table JOB:** JOB TYPE_OF_JOB S ------ ---------- - J01 Packing A J02 Editing A J03 Moulding B J04 Accounting B J05 Printing B **5. Create the table JOB_ASSIGNED with the fields (worker_id, job_id, starting_date, number_of_days)**

	Constraints on table JOB_ASSIGNED: worker_id references WORKER table, job_id references JOB table. **6. Insert the following records into the table JOB_ASSIGNED:** WOR JOB STARTING_ NUMBER_OF_DAYS ------- ------ ---------- ----- -------------------------- W01 J01 15-SEP-09 35 W02 J01 20-SEP-08 34 W03 J04 12-OCT-09 39 W01 J05 19-OCT-09 10 W02 J04 12-SEP-08 25
15	➢ **Perform the following queries on the tables given in Set no. 19:** **1. Display the date on which each worker is going to end his presently assigned job.** **2. Display how many days remain for each worker to finish his job.** **3. Display the STARTING_DATE in the following format - 'The fifth day of month of October, 2004'.** **4. Change the status to 'Complete' for all those jobs, which started in year 2008.** **5. Display job details of all those jobs where at least 25 workers are working.** **6. Display all those jobs that are already incompleted.**
16	➢ **Perform the following queries on the tables given in Set no. 19:** **1. Find all the jobs, which begin within the next two weeks.** **2. List all workers who have their wage per hour ten times greater than the wage of their managers.** **3. List the names of workers who have been assigned the job of Packing.** **4. What is total number of days allocated for printing on the goods for all the workers together.** **5. Which workers receive higher than average wage per hour.**
17	➢ **Perform the following queries on the tables given in Set no. 19:** **1. Display details of workers who are working on more than one job.** **2. Which workers having specialization in polishing start their job in September?** **3. Display details of workers who are specialized in the same field as that of Mr.Cacophonix or have a wage per hour more than any of the workers.** **4. Find the names of the workers who are getting more then 50 Rs. as wages per hour.** **5. Find the jobs which are assigned after 31-DEC-2008.**
18	**1. Create the following table named table as CUSTOMER with following fields-Cust_No, First_Name, Last_Name, Address, City, State, Pin, B_Date, Status.** **Constraints on table CUSTOMER:** Cust_No Primary Key, First_Name Not Null and the values for status must be in ('V','I','A').

2. Insert the following records into the table CUSTOMER:

CUST_NO	FIRST_NAME	LAST_NAME	ADDRESS	CITY	STATE	PIN	B_DATE	STATUS
1003	RAJ	BAHADUR	SHANTI VILLA	UDP	KARNATAKA	576101	1-AUG-70	V
1004	FELIX	SIMON	M-J-56	PJM	GOA	403002	12-FEB-71	A
1005	RAJAN	KUTTY	A1 TRADERS	KNR	KERALA	670001	9-JUN-71	A
1006	SHILPA	PAI	12/4B	MNG	KARNATAKA	574154	11-DEC-70	I
1007	BOSCO	RAKSHIT	R.K. PLAZA	BNG	KARNATAKA	576201	1-JAN-71	A

19

➢ **Perform the following queries on the tables given in Set no. 23:**

1. **Display all the records from the table where state is KARNATAKA.**
2. **Delete the row from the table where PIN CODE is 576201.**
3. **Change the ADDRESS as "KAVI MUDDANNA MARG" AND PIN=576104 where CUST_NO=1003.**
4. **Delete the records of KARNATAKA state from the table and then retrieve all the records back.**
5. **Select all the records with single occurrence of state from the table.**
6. **Sort and display the customer data, in the alphabetic order of state.**
7. **Sort and display the state field in the in descending order.**
8. **Retrieve records of Karnataka / Kerala customers who are ACTIVE ('A').**
9. **Retrieve rows where name contains the word RAJ embedded it.**
10. **Display all the rows whose dates are in the range of 10-JAN-70 and 31-JUL-96.**

Learning Outcomes:

- Enable the student to model the real world data into database framework.
- Creation of conceptual design using tools like E-R Diagram.
- Clear understanding of how to map the logical design of database into physical design.
- To get familiar with the SQL query environment.
- Representation of queries into equivalent relational algebraic expression.

Books Recommended:

- "Database System Concepts", Silberschatz, Korth, Sudarshan, 5th Edition, McGraw Hill Publication
- "SQL/PLSQL, The Programming Language of ORACLE", Ivan Bayross, BPB Publication
- "Fundamentals of Database Systems", Elmsari, Navathe, 5th Edition, Pearson Education (2008)
- "Database Systems : Design, Implementation and Management", Peter Rob, Carlos Coronel, 7th Edition, Cengage Learning (2007)
- "An Introduction to Database Systems", C J Date, A Kannan, S Swaminathan, 8th Edition, Pearson Education (2006)
- "Database Management Systems, Ramakrishnan", Gehrke, , McGraw Hill, Third Edition.

C. U. SHAH UNIVERSITY

Faculty of Computer Science

Master of Science (Information Technology) - (M.Sc.I.T.)

(2 years – Four Semester Full Time Course)

Semester : I Subject Code: MSIT103 Name: BASICS OF COMPUTER ARCHITECTURE

Sr. No.	Subject Code	Name of the Subject	Teaching Scheme (Hours)				Evaluation Scheme								
							Theory					Practical (Marks)			
							Sessional Exam		University Exam						
			Th	Tu	Pr	Total	Marks	Hrs	Marks	Hrs	Total	Pr/ Viva	TW	Total	Total
1	MSIT103	BASICS OF COMPUTER ARCHITECTURE	4		4		30	1.5	70	2.5	100				**100**

Objectives:

- To be able to understand the concepts of Computer Basics
- To develop Proficiency in Creating Circuits Designing.

Prerequisites:

- Knowledge of Basic Computer Fundamentals

Course Outline:

Sr. No.	Course Contents	Number of Hours
1	**Basics of Computer** Introduction to Computer, block diagram of digital computer, Input-output devices (VDU, scanner, mouse, keyboard, printer, plotter, Joystick, multimedia projector)	3
2	**Number System** (I) Basics of Number System Introduction, Binary Number System, Decimal Number System Conversions Of Binary, Decimal, Octal, Hexadecimal number system	8

	(II) Binary Operations in number system Binary Addition,subtraction,multiplication,Division (III)Complements in Number system 1's Complements,2's Complements,n's complement Binary Addition & Subtraction using complements (IV) Binary Number System Codes Weighted and Non-weighted codes BCD Code: Excess Three (XS-3) Code Gray Code: Binary to Gray & Gray to Binary	
3	**Boolean Algebra** Introduction of Boolean algebra, Boolean Expression & Boolean Function Operations of Boolean algebra, Laws of Boolean algebra, De Morgan's law Perfect induction Method, Simplification of Boolean Expressions	7
4	**Application of Logic Gates & Bo0lean Algebra** Introduction to Gate, Types of Gate, Universal Gate(Proof of Universal gate) Duality in Boolean algebra	6
5	**Combinational Circuit** Introduction of Combinational Circuit, Half Adder, Full adder, BCD Adder(4-bit),Parallel Binary Adder,Half Subtractor, Full subtractor Decoder (Binary To Otcal Converter) , encoder,Decoder using NAND Gate, Multiplexer, DeMUX	5
6	**Sequential Circuit** Sequential Circuit, Differentiate Circuit differ from Combinational Circuit, Flip flop Introduction, using NAND & NOR gates.,SR flipflop using NAND & NOR gates(with truth table), JK Flipflop(with truth table), ,Master-slave JK Flipflop, Registers,Types of Registers, Counters, Binary Counters, Asynchronous Binary Counter	8
7	**Memory Unit** What is Memory? Types of Memory(Memory Hierarchy),RAM,ROM,RAM V/s ROM, Secondary Storage Memory(Harddisk, floopy disk, Magnetic Disk), Cache Memory, Virtual Memory	3
8	**CPU & I/O Organization** Stack Organization (Intro.),Instruction Formats,Addressing modes Asynchronous	7

	Data Transfer,Modes of Transfer,Direct Memory Access(DMA), Addressing Modes	
9	**Basics of Microprocessor** Introduction to Microprocessor, Introduction To 8086 Microprocessor Instruction & pin Diagram of 8086 Microprocessor	3
	Total Lecture	**50**

Learning Outcomes:

- Student learn about the digital computer System from the beginning word "digit" to architecture of Microprocessor
- Students will get the dept knowledge of Computer Architecture & Actual work of digital computer system.

Teaching & Learning Methodology:

- Using Whiteboard & Multimedia or OHP

Books Recommended:

- "Computer System Architecture", Moris Mano, Pearson publication
- "Digital electronics," Aditya Chaturvedi, Khanna publication.

C. U. SHAH UNIVERSITY

Faculty of Computer Science

Master of Science (Information Technology) - (M.Sc.I.T.)

(2 years – Four Semester Full Time Course)

Semester : I Subject Code: MSIT104 Name: STATISTICAL METHODS FOR COMPUTER SCIENCE

Sr. No.	Subject Code	Name of the Subject	Teaching Scheme (Hours)				Evaluation Scheme								
							Theory					Practical (Marks)			
							Sessional Exam		University Exam						
			Th	Tu	Pr	Total	Marks	Hrs	Marks	Hrs	Total	Pr/ Viva	TW	Total	Total
1	MSIT104	STATISTICAL METHODS FOR COMPUTER SCIENCE	4		4		30	1.5	70	2.5	100				**100**

Objectives:

- The objective of this course is to present the foundations of many basic computer related concepts and provide a coherent development to the students for the courses.
- This course will enhance the student's ability to think logically and mathematically.

Prerequisites:

- Knowledge of basic arithmetic.

Course Outline:

Sr. No.	Course Contents	No. of Hours
1	**Data and Statistics** Data, Data Sources, Tabular and Graphical Representations, Qualitative data, Quantitative data, Cross-tabulations and Scatter diagrams	**4**

2	**Descriptive Statistics:** Measures of Location: Mean, Median, Mode, Percentiles, Quartiles Measures of Variability Measures of Association between Two Variables The Weighted Mean and Working with Grouped Data	**6**
3	**Probabilities:** Events and their probabilities Relationship of Probabilities Conditional Probabilities Bayes' Theorem	**4**
4	**Correlation** Perfect Positive Correlation, Perfect Negative Correlation, Moderately Positive Correlation, Moderately Negative Correlation, Lack of Correlation The Pearson Product Moment Correlation Spearman's Rank Correlation	**4**
5	**Regression** Regression Line, Regression Coefficients	**3**
6	**Dispersion** Range, Quartile Deviation, Mean Deviation, Standard Deviation	**3**
	Total Lecture	**24**
	Total hours	**48**

Learning Outcomes:

- The student will be able to apply concepts to RDBMS, perform minimization of Boolean functions, shall learn the fundamentals representations methods of graphs and trees.
- They shall be able to use different logical reasoning to prove theorems.

Books Recommended:

- "Statistics for Business and Economics", Anderson, Sweeney & Williams, Cengage Learning, 11th Edition
- "Statistics Concepts and Applications", Nabendu Pal & Sahadeb Sarkar, PHI.

C. U. SHAH UNIVERSITY

Faculty of Computer Science

Master of Science (Information Technology) - (M.Sc.I.T.)

(2 years – Four Semester Full Time Course)

Semester : I **Subject Code: MSIT105** **Name: COMMUNICATUON & SOFT SKILLS DEVELOPMENT**

Sr. No.	Subject Code	Name of the Subject	Teaching Scheme (Hours)				Evaluation Scheme								
							Theory					Practical (Marks)			
							Sessional Exam		University Exam						
			Th	Tu	Pr	Total	Marks	Hrs	Marks	Hrs	Total	Pr/ Viva	TW	Total	Total
1	MSIT105	COMMUNICATUON & SOFT SKILLS DEVELOPMENT	4		4		30	1.5	70	2.5	100				**100**

Objectives:

- The purpose of this course is to develop the students' competence in communication at an advanced level.
- Assuming that the students are fairly proficient in the basic communication skills of listening, speaking, and reading & writing in English.
- To give a global competitive edge to the students by way of honoring their professional communication skills.
- To enhance the employability skills of the students, train them to prepare career oriented contributor
- To make them aware of the process of interview and competencies required.

Prerequisites:

- Students should have basic knowledge of English language and grammar.
- Students should have ability to speak and write correct sentence in their day to day language.
- Students should be familiar with correct usage of language.
- Students should have basic knowledge of professional communication.

Course Outline:

Sr. No.	Course Contents	Number of Hours
1	**Features of Indian English Communication** Correction of sentences – Informal conversation Vs Formal expression – Verbal and non-verbal communication, barriers to effective communication – kinesics – Types of communication–Listening, Speaking, Reading and Writing, Telephone etiquette.	5
2	**Technical presentations** Types of presentation–video conferencing–participation in meeting–chairing sessions–Formal and informal interviews–interviewing in different setting and for different purposes performance appraisal, Public Speaking, Debate and Group Discussion	5
3	**Written communication** Differences between spoken and written communication – features of effective writing such as clarity and brevity.	6
4	**Letter-writing** Business letters–pro-forma culture–format – style – effectiveness, promptness - Analysis of sample letters collected from industry – email, fax.	6
5	**Technical Report writing** Business and Technical Reports Types of reports – progress reports, routine reports – Annual reports – format – Analysis of sample reports from industry – Synopsis and Dissertation writing.	12
6	**Personality development, personal grooming and soft skills**	4
7	**Employability skills**	4
8	**Interviews**	4
9	**Resume Writing**	4
	Total hours	48

Learning Outcomes:

- Develop their personality and personal grooming to work effectively at workplace.
- Be able to prepare their resume in highly contributor manner and develop their employability skills, for interview and technical report writing.

Teaching-Learning Methodology:

- The teaching will be made effective through interactive class room approach.
- Different kind of soft skills will be improved through drilling method.
- Active and inactive resources such as Audio & Video will be utilize for effective teaching learning process.

Books Recommended:-

- "Essentials of Business Communication", Rajendra Pal, JS KorlahaHi: Sultan Chand & Sonn
- :Basic Communication Skills for Technology", Andrea J. Rutherford: Pearson Education Asia
- "Business Communication", RK Madhukar, Vikas Publishing House Pvt. Ltd.
- "English for Technical Communication – vols. 1 and 2", K.R. Lakshminarayana, SCITECH Publications (India) Pvt. Ltd., T. Nagar, Chennai
- "Writing Remedies: Practical Exercises for Technical Writing", Edmond H Weiss, Universities Press, Hyderabad.