BASIRHAT COLLEGE

DEPARTMENT OF COMPUTER SCIENCE

LESSON PLAN-2020-2021

B.Sc. Program with Computer Science (GE/DSC)

Semester-ll

Paper Title- DBMS

Paper Code- CMSGCOR02T

Credits-4

COURSE OUTCOME: -
After completion of this course the students will be able –

CO1 . Identify the basic concepts and various data model used in database design ER

modelling concepts and architecture use and design queries using SQL.

CO2 . Apply relational database theory and be able to describe relational algebra
expression, tuple and domain relation expression fro queries.

CO3 . Recognize and identify the use of normalization and functional dependency,
indexing and hashing technique used in database design.

CO4 . Recognize/ identify the purpose of query processing and optimization and also
demonstrate the basic of query evaluation.

CO5 . Apply and relate the concept of transaction, concurrency control and recovery in
database.

CO6 . Discuss recovery system and be familiar with introduction to web database.

MONTH	COURSE/ TOPIC	TEACHER	CLASS HOUR	TUTORIAL
April	**Introduction to Database Management Systems**: Characteristics of database approach, datamodels, DBMS architecture and data independence.	DP	DP-7 FA-7	THEORYTICAL-8 PRACTICAL-5 TUTORIAL-1

	1. Create tables with relevant foreign key constraints 2. Populate the tables with data 3. Perform the following queries on the database : 1. Display all the details of all employees working in the company. 2. Display ssn, lname, fname, address of employees who work in department no 7. 3. Retrieve the birthdate and address of the employee whose name is 'Franklin T. Wong' 4. Retrieve the name and salary of every employee 5. Retrieve all distinct salary values.			
	Entity Relationship and Enhanced ER Modeling: Entity types, relationships, SQL-99: Schema Definition , constraints, and object modeling. 6. Retrieve all employee names whose address is in „Bellaire" 7. Retrieve all employees who were born during the 1950s 8. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive) 9. Retrieve the names of all employees who do not have supervisors 10. Retrieve SSN and department name for all employees	FA		
May		DP	DP-10	THEORYTICAL-

				FA-8	9 PRACTICAL-7 TUTORIAL-2
	Relational Data Model : Basic concepts, relational constraints, 11. Retrieve the name and address of all employees who work for the 'Research' department 12. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birthdate. 13. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor. 14. Retrieve all combinations of Employee Name and Department Name 15. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan" either as a worker or as a manager of the department that controls the project.				
	relational algebra, SQLqueries. 16. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees. 17. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name. 18. Select the names of	FA			

	employees whose salary does not match with salary of any employee in department 10. 19. Retrieve the name of each employee who has a dependent with the same first name and same sex as the employee. 20. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.			
June	**Database design:** ER and EER to relational mapping, functional dependencies, 21. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper headings. 22. Find the sum of the salaries and number of employees of all employees of the „Marketing" department, as well as the maximum salary, the minimum salary, and the average salary in this department. 23. Select the names of employees whose salary is greater than the average salary of all employees in department 10. 24. For each department, retrieve the department number, the number of employees in the department, and their average salary. 25. For each project, retrieve the project number, the project name, and the number of employees who work on that project. 26. Change the location and controlling department number for all projects having more than	DP	DP-6 FA-5	THEORYTICAL-6 PRACTICAL-4 TUTORIAL-1

	5 employees to „Bellaire" and 6 respectively.			
	normal forms up to third normal form. 27. For each department having more than 10 employees, retrieve the department no, no of employees drawing more than 40,000 as salary. 28. Insert a record in Project table which violates referential integrity constraint with respect to Department number. Now remove the violation by making necessary insertion in the Department table. 29. Delete all dependents of employee whose ssn is „123456789". 30. Delete an employee from Employee table with ssn = „12345"(make sure that this employee has some dependents, is working on some project, is a manager of some department and is supervising some employees). Check and display the cascading effect on Dependent and Works on table. In Department table MGRSSN should be set to default value and in Employee table SUPERSSN should be set to NULL 31. Perform a query using alter command to drop/add field and a constraint in Employee table.	FA		
		TOTAL	43	

Resources :

Books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010.
2. R. Ramakrishanan, J. Gehrke, Database Management Systems 3rd Edition, McGraw-Hill, 2002.
3. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, McGraw Hill, 2010.
4. R. Elmasri, S.B. Navathe Database Systems Models, Languages, Design and application Programming, 6th Edition, Pearson Education, 2013.

B.Sc. Program with Computer Science (GE/DSC)

Semester-IV

Paper Title- Computer System Architecture

Paper Code- CMSGCOR04T

Credits-4

COURSE OUTCOME: -
After completion of this course the students will be able –

CO1 . Identify the basic concepts of gates.

CO2 . Identify the concepts of different types of combinational circuit.

CO3 .Introduction to computers and CPUs, as well as concepts of stored programmes.

CO4. Instruction, Instruction Cycle, Interrupt, and Interrupt Cycle are all covered in this course.

CO5 . familiarity with Addressing Modes, I/O Bus Concept, and DMA Controller.

CO6 . familiarity with Memory Hierarchy, Cache Memory, Replacement Algorithms, Mobile Devices Architecture & Synchronous and Asynchronous Data Transfer.

MONTH	COURSE/ TOPIC	TEACHER	CLASS HOUR	TUTORIAL
April	**Introduction:** Logic gates, boolean algebra, combinational circuits, circuit simplification, flip-flops and sequential circuits, decoders, multiplexors, registers, counters and memory units. 1. Create a machine based on the following architecture: Register Set Refer to Chapter-5 of Morris Mano for description of instructions. ii) Create the micro operations and associate with instructions as given in the chapter (except	DP	DP-7 FA-7	THEORYTICAL-8 PRACTICAL-5 TUTORIAL-1

	interrupts). Design the register set, memory and the instruction set. Use this machine for the assignments of this section. iii) Create a Fetch routine of the instruction cycle.			
	Data Representation and basic Computer Arithmetic: Number systems, complements, fixed and floating point representation, character representation, addition, subtraction, magnitude comparison. iv) Simulate the machine to determine the contents of AC, E, PC, AR and IR registers in hexadecimal after the execution of each of following register reference instructions: a. CLA e. CIR i. SNA b. CLE f. CIL j. SZA c. CMA g. INC k. SZE d. CME h. SPA l. HLT	FA		
May	**Basic Computer Organization and Design:** Computer registers, bus system, instructionset, timing and control, instruction cycle, 6. Simulate the machine for the memory-reference instructions referred in above question with I= 1 and address part = 082. The instruction to be stored at address 026 in RAM. Initialize the memory word at address 082 with the value 298. Initialize the memory word at address 298	DP	DP-9 FA-9	THEORYTICAL-9 PRACTICAL-7 TUTORIAL-2

	with operand B8F2 and AC with A937. Determine the contents of AC, DR, PC, AR and IR in hexadecimal after the execution.			
	memory reference, input-output and interrupt. **Central Processing Unit:** Register organization, arithmetic and logical micro-operations, stack organization, micro programmed control. 7. Modify the machine created in Practical 1 according to the following instruction format: **Instruction format** 0 2 3 4 15	FA		
June	**Programming the Basic Computer:** Instruction formats, addressing modes, instruction codes, machine language, a. The instruction format contains a 3-bit opcode, a 1-bit addressing mode and a 12-bit address. There are only two addressing modes, I = 0 (direct addressing) and I = 1 (indirect addressing). b. Create a new register I of 1 bit.	DP	DP-6 FA-5	THEORYTICAL-6 PRACTICAL-4 TUTORIAL-1
	assembly language, input output programming. **Input-output Organization:** Peripheral devices, I/O interface, Modes of data transfer, direct memory access.	FA		

	c. Create two new microinstructions as follows : i. Check the opcode of instruction to determine type of instruction (Memory Reference/Register Reference/Input-Output) and then jump accordingly. ii. Check the I bit to determine the addressing mode and then jump accordingly.			
		TOTAL	43	

Resources :

Books:

1. M. Mano, Computer System Architecture, Pearson Education 1992.

2. A. J. Dos Reis, Assembly Language and Computer Architecture using C++ and JAVA, Course Technology, 2004

3. W. Stallings, Computer Organization and Architecture Designing for Performance, 8th Edition, Prentice Hall of India ,2009

4. Digital Design, M.M. Mano, Pearson Education Asia, 1979

B.Sc. Program with Computer Science (GE/DSC)

Semester-VI

Paper Title- Software Engg

Paper Code- CMSGDSE03T

Credits-6

COURSE OUTCOME: -
After completion of this course the students will be able –

CO1 . Apply the concepts of life cycle models to choose the appropriate model.

CO2 . Analyse the requirements and design the software.

CO3 . Construct or implement the software based on the industry standards

CO4 . Design and develop test cases

CO5 . Work with version control and work on configuration and release management plans

CO6 . Acquire knowledge on testing.

MONTH	COURSE/ TOPIC	TEACHER	CLASS HOUR	TUTORIAL
April	**Basic concepts** : Components of data communication, standards and organizations, NetworkClassification, Network Topologies ;	DP	DP-10	THEORYTICAL-8 PRACTICAL-5 TUTORIAL-1
	network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite.	FA	FA-4	
May	**Network Layer** : Virtual Circuits and Datagram approach, IP addressing methods – Subnetting; Routing Algorithms (adaptive and non-adaptive)	DP	DP-12	THEORYTICAL-10 PRACTICAL-6 TUTORIAL-2

	Physical Layer : Cabling, Network Interface Card, Transmission Media Devices- Repeater, Hub, Bridge, Switch, Router, Gateway.			
	Data Link Layer : Framing techniques; Error Control; Flow Control Protocols; Shared media protocols - CSMA/CD and CSMA/CA.	FA	FA-6	
June	**Transport Layer:** Transport services, Transport Layer protocol of TCP and UDP **Application Layer** : Application layer protocols and services – Domain name system, HTTP, WWW, telnet, FTP, SMTP	DP	DP-8	THEORYTICAL-6 PRACTICAL-4 TUTORIAL-1
	Network Security : Common Terms, Firewalls, Virtual Private Networks	FA	FA-3	
		TOTAL	43	

Resources :

Books:

1. Roger S.Pressman, Software engineering- A practitioner‟s Approach, McGraw-Hill

2. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.

3. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.

4. James F Peters and Witold Pedryez, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.

5. Ali Behforooz and Frederick J Hudson, "Software Engineering Fundamentals", Oxfor University Press, New Delhi, 1996.

6. Pfleeger, "Software Engineering", Pearson Education India, New Delhi, 1999.

7. Carlo Ghezzi, Mehdi Jazayari and Dino Mandrioli, "Fundamentals of Software Engineering", Prentice Hall of India, New Delhi, 1991.

B.Sc. Program with Computer Science (GE/DSC)

Sec-2

Paper Title- R programming

Paper Code- CMSSSEC02M

Credits-2

COURSE OUTCOME: -
After competing this course, you will be able to:

CO1 . Explain critical R programming concepts

CO2 . Demonstrate how to install and configure RStudio

CO3 . Apply OOP concepts in R programming

CO4 . Explain the use of data structure and loop functions

CO5 . Analyse data and generate reports based on the data

CO6 . Apply various concepts to write programs in R

MONTH	COURSE/ TOPIC	TEACHER	CLASS HOUR	TUTORIAL
April	Introduction: Overview and History of R, Getting Help, Data Types, Subsetting, Vectorized Operations, 1. Write a program that prints „Hello World" to the screen. 2. Write a program that asks the user for a number n and prints the sum of the numbers 1 to n 3. Write a program that prints a multiplication table for numbers up to 12.	FA	FA-3	THEORYTICAL-2 PRACTICAL-1
May	Reading and Writing Data. Control Structures, Functions, lapply, tapply, split, mapply, apply, Coding Standards	FA	FA-3	THEORYTICAL-2 PRACTICAL-1

	4. Write a function that returns the largest element in a list. 5. Write a function that computes the running total of a list. 6. Write a function that tests whether a string is a palindrome.			
June	Scoping Rules, Debugging Tools, Simulation, R Profiler. 7. Implement the following sorting algorithms: Selection sort, Insertion sort, Bubble Sort 8. Implement linear search. 9. Implement binary search. 10. Implement matrices addition , subtraction and Multiplication	FA	FA-4	THEORYTICAL-2 PRACTICAL-2
		TOTAL	10	

Resources :

 Books:

1. W. N. Venables, D. M. Smith, An Introduction to R, Rcore

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B.Sc. Program with Computer Science (GE/DSC)

Sec-1

Paper Title- Programming in Python

Paper Code- CMSSSEC01M

Credits-2

COURSE OUTCOME: -
After competing this course, you will be able to:

CO1 . Event Driven Programming in Python Program.

CO2 . To create efficient program using functions to implement reusability.

CO3 . Apply the structures in making application software using GUI Programming.

CO4 . Acquire the skills to write Python database apps.

CO5 . learn Python's Object-Oriented Skills

CO6 . learn to create and package reusable Python modules

MONTH	COURSE/ TOPIC	TEACHER	CLASS HOUR	TUTORIAL
April	**Planning the Computer Program:** Concept of problem solving, Problem definition, Programdesign, Debugging, Types of errors in programming, Documentation. **Techniques ofProblem Solving:** Flowcharting, decision table, algorithms, Structured programming concepts,Programming methodologies viz. top-down and bottom-up programming. 1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users	FA	FA-4	THEORYTICAL-3 PRACTICAL-1

	choice. 2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria : Grade A: Percentage >=80 Grade B: Percentage>=70 and <80 Grade C: Percentage>=60 and <70 Grade D: Percentage>=40 and <60 Grade 1. Percentage<40 1 Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input paramters from user. 2 WAP to display the first n terms of Fibonacci series.			
May	**Overview of Programming :** Structure of a Python Program, Elements of Python **Introduction to Python:** Python Interpreter, Using Python as calculator, Python shell, Indentation.Atoms, Identifiers and keywords, Literals, Strings, Operators(Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator). 3 WAP to find factorial of the given number. 4 WAP to find sum of the	FA	FA-5	THEORYTICAL-3 PRACTICAL-2

	following series for n terms: $1 – 2/2! + 3/3! - - - - - n/n!$ 5 WAP to calculate the sum and product of two compatible matrices. 4. Write a menu-driven program to create mathematical 3D objects I. curve 4. sphere III. cone IV. arrow 1. ring VI. cylinder. 1. WAP to read n integers and display them as a histogram. 2. WAP to display sine, cosine, polynomial and exponential curves.			
June	**Creating Python Programs :** Input and Output Statements, Control statements(Branching,Looping, Conditional Statement, Exit function, Difference between break, continue and pass.), Defining Functions, default arguments. 3. WAP to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered by the user. 4. WAP to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula $m=60/(t+2)$, where t is the time in hours. Sketch a graph for t vs. m, where $t>=0$. 5. A population of 1000 bacteria is introduced into a nutrient	FA	FA-2	THEORYTICAL-1 PRACTICAL-1

	medium. The population p grows as follows: P(t) = (15000(1+t))/(15+ *e)* where the time t is measured in hours. WAP to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval. 1. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion: I. velocity wrt time (v=u+at) II. distance wrt time (s=u*t+0.5*a*t*t) a. distance wrt velocity (s=(v*v-u*u)/2*a) 1. WAP to show a ball bouncing between 2 walls. (Optional)			
		TOTAL	20	

Resources :

 Books:

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. Python Tutorial/Documentation www.python.or 2015
3. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : learning with Python , Freely available online.2012
4. http://docs.python.org/3/tutorial/index.html
5. http://interactivepython.org/courselib/static/pythonds
6. http://www.ibiblio.org/g2swap/byteofpython/read/