

Yogoda Satsanga Palpara Mahavidyalaya

Department of Computer Science

Session:-2020-2021

TEACHING PLAN

B Sc (General)

Semester	Paper	Unit/Module		Teacher	No. of lectures	To be completed by
Semester-1	DSC1AT: Problem Solving using Computers	Computer Fundamentals:	Introduction to Computers: Characteristics of Computers, Uses of computers, Types and generations of Computers. Basic Computer Organization - Units of a computer, CPU, ALU, memory hierarchy, registers, I/O devices.	Mr. Arnab Chakraborty (SACT)	40	1 st Month
		Planning the Computer Program:	Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.			1 st Month
		Techniques of Problem Solving:	Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.			2 nd month
		Overview of Programming:	Structure of a Python Program, Elements of Python			2 nd month
		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			3 rd month

			Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator).			
		Creating Python Programs	Input and Output Statements, Control statements (Looping- while Loop, for Loop , Loop Control, Conditional Statement- if...else, Difference between break, continue and pass).			3 rd month
		Structures	Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules, Defining Functions, Exit function, default arguments.			4 th Month
		Introduction to Advanced Python:	Objects and Classes, Inheritance, Regular Expressions, Event Driven Programming, GUI Programming.			4 th month
	DSC1AP: Software Lab using Python(Lab)	Section: A (Simple programs)	<p>1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.</p> <p>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.</p> <p>3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.</p> <p>4. WAP to display the first n terms of Fibonacci series.</p>	Mr. Arnab Chakraborty (SACT)	40	1 st month And 2 nd month

			<p>5. WAP to find factorial of the given number.</p> <p>6. WAP to find sum of the following series for n terms: $1 - \frac{2}{2!} + \frac{3}{3!} - \dots - \frac{n}{n!}$</p> <p>7. WAP to calculate the sum and product of two compatible matrices.</p>			
		Section: B (Visual Python):	<p>All the programs should be written using user defined functions, wherever possible.</p> <p>1. Write a menu-driven program to create mathematical 3D objects I. curve II. sphere III. cone IV. arrow V. ring VI. Cylinder.</p> <p>2. WAP to read n integers and display them as a histogram.</p> <p>3. WAP to display sine, cosine, polynomial and exponential curves.</p> <p>4. 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.</p> <p>5. WAP to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula $m = \frac{60}{t+2}$, where t is the time in hours. Sketch a graph for t vs. m, where $t \geq 0$.</p> <p>6. Input initial velocity and acceleration, and plot the following graphs depicting</p>			3 rd month And 4 th month

			equations of motion: I. velocity wrt time ($v=u+at$) II. distance wrt time ($s=u*t+0.5*a*t*t$) III. distance wrt velocity ($s=(v*v-u*u)/2*a$)			
SEMESTER-II	DSC1BT: Database Management Systems	Introduction to Database Management Systems:	Characteristics of database approach, data models, DBMS architecture and data independence.	Mrs. Sova Pal (Bera) (Associate Professor)	40	1 st month
		Entity Relationship and Enhanced ER Modeling:	Entity types, relationships, SQL- 99:Schema Definition , constraints, and object modeling.			2 nd month
		Relational Data Model	Basic concepts, relational constraints, relational algebra, SQL queries.			3 rd month
		Database design:	ER and EER to relational mapping, functional dependencies, normal forms up to third normal form.			4 th month
	DSC1BP: Software Lab based on Database Management Systems (Lab)	DDL Commands	Create table, alter table, drop table	Mrs. Sova Pal (Bera) (Associate Professor)	40	1 st month
		DML Commands	<ul style="list-style-type: none"> • Select , update, delete, insert statements • Condition specification using Boolean and comparison operators (and, or, not, =, <>, >, <, >=, <=) • Arithmetic operators and aggregate functions(Count, sum, avg, Min, Max) • Multiple table queries 			1 st month And 2 nd month

			(join on different and same tables) <ul style="list-style-type: none"> • Nested select statements • Set manipulation using (any, in, contains, all, not in, not contains, exists, not exists, union, intersect, minus, etc.) • Categorization using group by.....having • Arranging using order by 			
		DQL	<ol style="list-style-type: none"> 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 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 			3 rd month And 4 th month

			<p>10. Retrieve SSN and department name for all employees</p> <p>11. Retrieve the name and address of all employees who work for the 'Research' department</p> <p>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.</p> <p>13. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.</p> <p>14. Retrieve all combinations of Employee Name and Department Name</p> <p>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</p>			
SEMESTE R-III	DSC1CT: Operating Systems	Introducti on	System Software, Resource Abstraction, OS strategies	Mrs. Sova Pal (Bera) (Associate Professor)	40	1 st month
		Types of operating systems	Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems.			1 st month

		Operating System Organization	Factors in operating system design, basic OS functions, implementation consideration; process modes, methods of requesting system services – system calls and system programs.			2 nd month
		Process Management	System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model			3 rd month
		Scheduling	Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies.			3 rd month
		Memory Management	Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory			4 th month
		Shell introduction and Shell Scripting	<ul style="list-style-type: none"> ➤ What is shell and various type of shell, Various editors present in linux ➤ Different modes of operation in vi editor ➤ What is shell script, Writing and executing the shell script ➤ Shell variable (user defined and system variables) ➤ System calls, Using system calls 			4 th month

	DSC1CP: Software Lab based on Operating Systems (Lab)	Linux	<p>1.Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd.</p> <p>2.Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man, date.</p> <p>3. Usage of following commands: chmod, grep, tput (clear, highlight), bc.</p> <p>4. Write a shell script to check if the number entered at the command line is prime or not.</p> <p>5. Write a shell script to modify “cal” command to display calendars of the specified months.</p> <p>6. Write a shell script to modify “cal” command to display calendars of the specified range of months.</p> <p>7. Write a shell script to accept a login name. If not a valid login name display message – “Entered login name is invalid”.</p> <p>8. Write a shell script to display date in the mm/dd/yy format.</p> <p>9. Write a shell script to display on the screen sorted output of “who” command along with the total number of users .</p> <p>10. Write a shell script to</p>	Mrs. Sova Pal (Bera) (Associate Professor)	40	1 st month And 2 nd month And 3 rd month And 4 th month

			<p>display the multiplication table any number,</p> <p>11. Write a shell script to compare two files and if found equal asks the user to delete the duplicate file.</p> <p>12. Write a shell script to find the sum of digits of a given number.</p> <p>13. Write a shell script to merge the contents of three files, sort the contents and then display them page by page.</p> <p>14. Write a shell script to find the LCD (least common divisor) of two numbers.</p> <p>15. Write a shell script to perform the tasks of basic calculator.</p> <p>16. Write a shell script to find the power of a given number.</p> <p>17. Write a shell script to find the factorial of a given number.</p> <p>18. Write a shell script to check whether the number is Armstrong or not.</p> <p>19. Write a shell script to check whether the file have all the permissions or not.</p> <p>20. Program to show the pyramid of special character “*”.</p>			
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	SEC1T: HTML Programmin g	Unit-I	Introduction	Mr. Suman Mondal (Assistant Professor)	40	1 st month
		Unit-II: The Basics	The Head, the Body, Colors, Attributes, Lists, ordered and unordered			1 st month
		Unit-III: Links	Introduction Relative Links, Absolute Links, Link Attributes, Using the ID Attribute to Link Within a Document.			2 nd month
		Unit-IV: Images	Putting an Image on a Page Using Images as Links, Putting an Image in the Background			2 nd month
		Unit V: Tables	Creating a Table Table Headers, Captions,Spanning Multiple Columns,Styling Table			3 rd month
		Unit VI: Forms	Basic Input and Attributes Other Kinds of Inputs, Styling forms with CSS,Where To Go From Here			4 th month
	SEC1P: Software Lab Based on HTML	The Basics	Q.1 Create an HTML document with the following formatting options: <ol style="list-style-type: none"> 1. Bold 2. Italics 3. Underline 4. Headings (Using H1 to H6 heading styles) 5. Font (Type, Size and Color) 6. Background (Colored background/Image in background) 7. Paragraph 8. Line Break 9. Horizontal Rule 10. Pre tag 	Mr. Suman Mondal (Assistant Professor)	40	1 st month

		Lists	Q.2 Create an HTML document which consists of: I. Ordered List II. Unordered List III. Nested List			1 st month
		Images	Putting an Image on a Page Using Images as Links, Putting an Image in the Background			2 nd month
		Tables	Creating a Table Table Headers, Captions,Spanning Multiple Columns,Styling Table			3 rd month
		Forms	Basic Input and Attributes Other Kinds of Inputs, Styling forms with CSS,Where To Go From Here			4 th month
		frame	Create HTML documents (having multiple frames) .			4 th month
SEMESTER -IV	DSC1DT: Computer System Architecture	Digital Electronics	1. Introduction Logic gates, boolean algebra, combinational circuits, circuit simplification, flip-flops and sequential circuits, decoders, multiplexers, registers, counters and memory units.	Mr. Arnab Chakraborty (SACT)	30	1 st Month And 2 nd month
			2. Data Representation and Basic Computer Arithmetic			3 rd month And 4 th Month
		Computer Architecture	Basic Computer Organization and Design			1 st Month
			Central Processing Unit	Mr. Suman Mondal (Assistant Professor)	30	2 nd month
			Memory Organization			3 rd month

			Input-Output Organization			4 th Month
	DSC1DP: Computer System Architecture Lab	Digital Experi ment	1. Design and implement a full adder circuit using NAND gates only. 2. Design and implement a J. K. flip-flop. 3. Design and implement a 4 bit adder using flip-flop.	Mr. Arnab Chakraborty (SACT)	30	1 st Month
			4. Design and implement a 4 bit synchronous counter. 5. Design and implement a 8:1 multiplexer. 6. Design and implement a D flip-flop.			2 nd month
			7. Design and implement a half subtractor using NAND gates only. 8. Design and implement a 3×8 decoder. 9. Design and implement a 8 bit parity generator. 10. Design and implement a two bit digital comparator.			3 rd month And 4 th Month
		Computer Architecture	Basic Computer Organization and Design			1 st Month
			Central Processing Unit	Mr. Suman Mondal (Assistant Professor)	30	2 nd month
			Memory Organization			3 rd month
			Input-Output Organization			4 th Month

	SEC2T: PHP Programming	Introduction to PHP:	PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.) PHP with other technologies, scope of PHP PHP Operators : Arithmetic, Assignment, Relational , Logical operators, Bitwise , ternary and MOD operator.	Mr. Suman Mondal (Assistant Professor)	40	1 st month
		Handling HTML form with PHP	1.Capturing Form Data 2. Dealing with multi value fields 3. GET and POST form methods 4.Redirecting a form after submission			1 st month
		PHP conditional events and Loops:	PHP IF Else conditional statements (Nested IF and Else) Switch case, while ,For and Do While Loop, Goto , Break ,Continue and exit.			2 nd month
		PHP Functions:	Function, Need of Function , declaration and calling of a function PHP Function with arguments, Default Arguments in Function,Function argument with call by value, call by reference, Scope of Function Global and Local			3 rd month
		String Manipulation and Regular Expression:	Creating and accessing String , Searching & Replacing String Formatting, joining and splitting String , String Related Library functions, Use and advantage of regular expression over inbuilt function, Use of preg_match(),			3 rd month

			preg_replace(), preg_split() functions in regular expression			
		Array:	Anatomy of an Array ,Creating index based and Associative array ,Accessing array Looping with Index based array, with associative array using each() and foreach(),Some useful Library function			4 th month
	SEC2P: PHP Programming (Lab)	Software Lab Based on PHP:	<p>1. Create a PHP page using functions for comparing three integers and print the largest number.</p> <p>2. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.</p> <p>3. WAP to check whether the given number is prime or not.</p> <p>4. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.</p> <p>5. Write a PHP function that checks if a string is all lower case.</p> <p>6. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)</p> <p>7. WAP to sort an array.</p>	Mr. Suman Mondal (Assistant Professor)	40	1 st month And 2 nd month And 3 rd month And 4 th month

			<p>8. Write a PHP script that removes the whitespaces from a string. Sample string : 'The quick " " brown fox' Expected Output : Thequick""brownfox</p> <p>9. Write a PHP script that finds out the sum of first n odd numbers.</p> <p>10. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.</p> <p>11. Write a PHP script that checks if a string contains another string.</p> <p>12. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day</p> <p>13. Using switch case and dropdown list display a "Hello" message depending on the language selected in drop down list.</p> <p>14. Write a PHP program to print Fibonacci series using recursion.</p> <p>15. Write a PHP script to replace the first 'the' of the following string with 'That'.</p>			
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SEMESTER -V	DSE1T: Programmin g in Java	Introductio n to Java:	Features of Java, JDK Environment	Mr. Arnab Chakrabor ty (SACT)	40	1 st month
		Object Oriented Programmi ng Concept	Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA			1 st month
		Java Programmi ng Fundament al :	Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch), Looping(for, while) , Type Casting			2 nd month
		Classes and Objects:	Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes			2 nd month
		Arrays and Strings:	Arrays, Creating an array, Types of Arrays, String class Methods, String Buffer methods.			3 rd month
		Abstract Class, Interface and Packages:	Modifiers and Access Control, Abstract classes and methods, Interfaces, Packages Concept, Creating user defined packages.			3 rd month
		Exception Handling:	Exception types, Using try catch and multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions.			3 rd month
		File Handling:	Byte Stream, Character Stream, File IO Basics, File Operations, Creating file, Reading file, Writing File			4 th month
		Applet	Introduction, Types Applet,			4 th month

		Programmi ng:	Applet Life cycle, Creating Applet, Applet tag			
	DSE1P: Software Lab based on Java (Lab)	Practical	<p>1. WAP to find the largest of n natural numbers.</p> <p>2. WAP to find whether a given number is prime or not.</p> <p>3. Write a menu driven program for following:</p> <ol style="list-style-type: none"> Display a Fibonacci series Compute Factorial of a number WAP to check whether a given number is odd or even. WAP to check whether a given string is palindrome or not. <p>4. WAP to print the sum and product of digits of an Integer and reverse the Integer.</p> <p>5. Write a program to create an array of 10 integers. Accept values from the user in that array. Input another number from the user and find out how many numbers are equal to the number passed, how many are greater and how many are less than the number passed.</p> <p>6. Write a program that will prompt the user for a list of 5 prices. Compute the average of the prices and find out all the prices that are higher than the calculated average.</p>	Mr. Arnab Chakrabor ty (SACT)	40	1 st month And 2 nd month And 3 rd month And 4 th month

			<p>7. Write a program in java to input N numbers in an array and print out the Armstrong numbers from the set.</p> <p>8. Write java program for the following matrix operations:</p> <ul style="list-style-type: none">a. Addition of two matricesb. Summation of two matricesc. Transpose of a matrix d. <p>Input the elements of matrices from user.</p> <p>9. Write a java program that computes the area of a circle, rectangle and a Cylinder using function overloading.</p> <p>10. Write a Java for the implementation of Multiple inheritance using interfaces to calculate the area of a rectangle and triangle.</p> <p>11. Write a java program to create a frame window in an Applet. Display your name, address and qualification in the frame window.</p> <p>12. Write a java program to draw a line between two coordinates in a window.</p> <p>13. Write a java program to display the following graphics in an applet window.</p> <ul style="list-style-type: none">a. Rectanglesb. Circlesc. Ellipsesd. Arcs			
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			<p>e. Polygons</p> <p>14. Write a program that reads two integer numbers for the variables a and b. If any other character except number (0-9) is entered then the error is caught by NumberFormatException object. After that ex.getMessage() prints the information about the error occurring causes.</p> <p>15. Write a program for the following string operations: a. Compare two strings b. Concatenate two strings c. Compute length of a string</p> <p>16. Create a class called Fraction that can be used to represent the ratio of two integers. Include appropriate constructors and methods. If the denominator becomes zero, throw and handle an exception.</p>			
	SEC3T: Programming with Matlab	MATLAB Basics	The MATLAB environment - Basic computer programming - Variables and constants, operators and simple calculations - Formulas and functions - MATLAB toolboxes	Mr. Suman Mondal (Assistant Professor)	40	1 st month
		Matrices and vectors	Matrix and linear algebra review - Vectors and matrices in MATLAB - Matrix operations and functions in MATLAB			2 nd month
		Computer programming	Algorithms and structures - MATLAB scripts and functions (m-files) - Simple sequential algorithms - Control structures			3 rd month
		MATLAB programming	Matlab Programming. Reading and writing data,			4 th month

		ng and Numerical Simulations	file handling - Personalized functions - Toolbox structure - MATLAB graphic functions. Numerical simulations. Numerical methods and simulations - Random number generation – Monte carlo methods			
	SEC3P: Programming with Matlab(Lab)	Matlab Programming	<p>1. A supermarket conveyor belt holds an array of groceries. The price of each product (in pounds) is [0.6, 1.2 ,0.5, 1.3] ; while the numbers of each product are [3, 2 ,1 ,5]. Use MATLAB to calculate the total bill.</p> <p>2. The sortrows(x) function will sort a vector or matrix X into increasing row order. Use this function to sort a list of names into alphabetical order.</p> <p>3. The —identity matrix is a square matrix that has ones on the diagonal and zeros elsewhere. You can generate one with the eye() function in MATLAB. Use MATLAB to find a matrix B, such that when multiplied by matrix $A = \begin{bmatrix} 1 & 2 \\ -1 & 0 \end{bmatrix}$ the identity matrix $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ is generated. That is $A*B=I$.</p> <p>4. Create an array of N numbers. Now find a single MATLAB statement that picks out from that array the 1,4,9,16,...,VNth entries, i.e. those numbers which have indices that are square numbers.</p>	Mr. Suman Mondal (Assistant Professor)	40	1 st month And 2 nd month

			5. Draw a graph that joins the points (0,1), (4,3), (2,0) and (5,-2).			
			6. Calculate and replay 1 second of a sinewave at 500Hz with a sampling rate of 11025Hz. Save the sound to a file called "ex35.wav". Plot the first 100 samples. 7. Calculate and replay a 2 second chirp. That is, a sinusoid that steadily increases in frequency with time, from say 250Hz at the start to 1000Hz at the end. 8. Build a square wave by adding together 10 odd harmonics: 1f, 3f, 5f, etc. The amplitude of the nth harmonic should be 1/n. Display a graph of one cycle of the result superimposed on the individual harmonics. 9. Write a function called FtoC (ftoc.m) to convert Fahrenheit temperatures into Celsius. Make sure the program has a title comment and a help page. Test from the command window with: i. FtoC(96) ii. lookfor Fahrenheit iii. help FtoC 10. Write a program to input 2 strings from the user and to print out (i) the concatenation of the two strings with a space between them, (ii) a line of asterisks the same length			3 rd month And 4 th month

			as the concatenated strings, and (iii) the reversed concatenation. For example: i. Enter string 1: Mark ii. Enter string 2: Huckvale iii. Mark Huckvale iv. ***** v. elavkcuHkraM			
SEMESTER -VI	DSE-2: Project Work		The students will be allowed to work on any project based on the concepts studied in core/elective or skill based elective courses. Theory classes will cover project management techniques.	Mrs. Sova Pal (Bera) (Associate Professor), Mr. Suman Mondal (Assistant Professor), Mr. Arnab Chakraborty (SACT)	40	1 st month And 2 nd month And 3 rd month And 4 th month
	SEC4T: R-Programming	Introduction	Overview and History of R, Getting Help, Data Types, Subsetting, Vectorized Operations, Reading and Writing Data.	Mr. Suman Mondal (Assistant Professor)	40	1 st month And 2 nd month
			Control Structures, Functions, lapply, tapply, split, mapply, apply, Coding Standards.			3 rd month
			Scoping Rules, Debugging Tools, Simulation, R Profiler.			4 th month
	SEC4P: R-Programming (Lab)	Software Lab Based on R Programming	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. 4. Write a function that returns the largest element	Mr. Suman Mondal (Assistant Professor)	40	1 st month And 2 nd month And 3 rd month And 4 th month

			<p>in a list.</p> <p>5. Write a function that computes the running total of a list.</p> <p>6. Write a function that tests whether a string is a palindrome.</p> <p>7. Implement the following sorting algorithms: Selection sort, Insertion sort, Bubble Sort</p> <p>8. Implement linear search.</p> <p>9. Implement binary search.</p> <p>10. Implement matrices addition , subtraction and Multiplication</p>			