

BASIRHAT COLLEGE

DEPARTMENT OF COMPUTER SCIENCE

LESSON PLAN-2020-2021

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

Semester-I

Paper Title- Problem Solving with Computer

Paper Code- CMSGCOR01T, CMSGCOR01P

Credits-6

COURSE OUTCOME: -

After completion of this course the students will be able –

CO1 Recognize the basic Basic Computer Organization like CPU, ALU, memory hierarchy, registers,I/O devices etc.

CO2 Recognize the basic data types , control statementsand and Loop in Python Program.

CO3. Summarize the concept of Objects and Classes, Inheritance, Regular

Expressions,Event Driven Programming in Python Program.

CO4. To create efficient program using functions to implement reusability.

CO5. Apply the structures in making application software using GUI Programming.

CO6. Generate files and use preprocessor for real world application.

MONTH	COURSE/ TOPIC	TEACHER	CLASS HOUR	TUTORIAL
September	Computer Fundamentals: Introduction to Computers: Characteristics of Computers, Uses of computers, Types and generations of Computers. Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.	DP	DP-9	THEORYTICAL- 10 PRACTICAL-7 TUTORIAL-2

	<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. Assign grades according to the following criteria :</p> <p>a. Grade A: Percentage ≥ 80</p> <p>b. Grade B: Percentage ≥ 70 and < 80</p> <p>c. Grade C: Percentage ≥ 60 and < 70</p> <p>d. Grade D: Percentage ≥ 40 and < 60</p> <p>e. Grade E: Percentage < 40</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>			
	<p>Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming. (4L)</p> <p>Overview of Programming: Structure of a Python Program, Elements of Python</p> <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</p>	<p>FA</p>	<p>FA-10</p>	

	matrices.			
October	<p>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).</p> <p>1. Write a menu-driven program to create mathematical 3D objects</p> <p>I. curve II. sphere III. cone IV. arrow V. ring VI. Cylinder.</p>	DP	DP-6	THEORYTICAL-5 PRACTICAL-3 TUTORIAL-2
	<p>Creating Python Programs: Input and Output Statements, Control statements (Looping-whileLoop, for Loop , Loop Control, Conditional Statement-if...else, Difference between break, continue and pass).</p> <p>2. WAP to read n integers and display them as a histogram. 3. WAP to display sine, cosine, polynomial and exponential curves.</p>	FA	FA-5	
November	<p>Structures: Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules,</p>	DP	DP-4	THEORYTICAL-3 PRACTICAL-2 TUTORIAL-2

	<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>Defining Functions, Exit function, default arguments.</p> <p>5. 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 $t \geq 0$.</p>	FA	FA-4	
December	<p>Introduction to Advanced Python: Objects and Classes, Inheritance, Regular Expressions,</p> <p>6. A population of 1000 bacteria is introduced into a nutrient 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.</p>	DP	DP-7	THEORYTICAL-7 PRACTICAL-4 TUTORIAL-2
	<p>Event Driven Programming, GUI Programming.</p> <p>7. 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 ($s=u*t+0.5*a*t*t$) III. distance wrt velocity (</p>	FA	FA-6	

	$s=(v*v-u*u)/2*a$			
		TOTAL	49	

Resources :

Books:

1. P. K. Sinha & Priti Sinha , “Computer Fundamentals”, BPB Publications, 2007.
2. Dr. Anita Goel, Computer Fundamentals, Pearson Education, 2010.
3. T. Budd, Exploring Python, TMH, 1st Ed, 2011
4. Python Tutorial/Documentation www.python.org 2010
5. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : learning with Python , Freely available online.2012
6. <http://docs.python.org/3/tutorial/index.html>
7. <http://interactivepython.org/courselib/static/pythonds>
8. <http://www.ibiblio.org/g2swap/byteofpython/read/>

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

Semester-III

Paper Title- OS

Paper Code- CMSGCOR03T, CMSGCOR03P

Credits-6

COURSE OUTCOME: -

After completion of this course the students will be able –

CO1 . Understand the basics of operating systems like kernel, shell, types and views of operating systems

CO2 . Describe the various CPU scheduling algorithms and remove deadlocks.

CO3 . Explain various memory management techniques and concept of thrashing

CO4 . Recognize file system interface, security mechanisms and protection .

CO5 . Use disk management and disk scheduling algorithms for better utilization of external memory.

CO6 . Explain the various features of distributed OS like Unix, Linux, windows etc. related algorithms

MONTH	COURSE/ TOPIC	TEACHER	CLASS HOUR	TUTORIAL
July August	Introduction: System Software, Resource Abstraction, OS strategies. 1. Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd.	DP	DP-9	THEORYTICAL-9 PRACTICAL-7 TUTORIAL-1
	Types of operating systems - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems. 2. Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man,	FA	FA-8	

	<p>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>			
September	<p>Operating System Organization: Factors in operating system design, basic OS functions, Process Management : System view of the process and resources, initiating the OS, process address space, process abstraction</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>	DP	DP-9	THEORYTICAL-10 PRACTICAL-7 TUTORIAL-1
	<p>implementation consideration; process modes, methods of requesting system services – system calls and system programs.</p> <p>resource abstraction, process hierarchy, Thread model</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 display the multiplication table any number,</p> <p>11. Write a shell script to</p>	FA	FA-9	

	<p>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>			
October	<p>Scheduling Mechanisms, Strategy selection, non-pre-emptive .</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>	DP	DP-4 FA-5	THEORYTICAL-5 PRACTICAL-3 TUTORIAL-1
	<p>Scheduling pre-emptive strategies.</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>	FA		
November	<p>Memory Management: Mapping address space to memory space</p> <p>19. Write a shell script to check whether the file have all the permissions or not.</p>	DP	DP-3	THEORYTICAL-3 PRACTICAL-1 TUTORIAL-1

	<p>memory allocation strategies,</p> <p>What is shell and various type of shell, Various editors present in linux</p> <ul style="list-style-type: none"> ● Different modes of operation in vi editor 	FA	FA-2	
December	<p>fixed partition, variable partition,</p> <ul style="list-style-type: none"> ● What is shell script, Writing and executing the shell script ● Shell variable (user defined and system variables) ● System calls, Using system calls ● Pipes and Filters ● Decision making in Shell Scripts (If else, switch), Loops in shell 	DP	DP-6	THEORYTICAL-7 PRACTICAL-4 TUTORIAL-1
	<p>paging, virtual memory</p> <ul style="list-style-type: none"> ● Functions ● Utility programs (cut, paste, join, tr , uniq utilities) ● Pattern matching utility (grep) <p>20. Program to show the pyramid of special character "*" .</p>	FA	FA-6	

		TOTAL	61	

Resources :

Books

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8 th Edition, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3 rd Edition, Pearson Education 2007.
3. G. Nutt, Operating Systems: A Modern Perspective, 2 nd Edition Pearson Education 1997.
4. W. Stallings, Operating Systems, Internals & Design Principles, 5 th Edition, Prentice Hall of India. 2008.
5. M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill 1992.

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

Semester-V

Paper Title- Programming in JAVA

Paper Code- CMSGDSE01T

Credits-6

COURSE OUTCOME: -

After completion of this course the students will be able –

CO1 . Learn basic concepts Java Programming Language

CO2 . Use the syntax and semantics of java programming language and basic concepts of OOP.

CO3 . Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and Method Overloading, Method Overriding, Nested and Inner classes.

CO4 . Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.

CO5 . Create wide range of Applications and Applets using Java and ability to work with I/O Streams

CO6 . Design event driven GUI and web related applications which mimic the real word scenarios.

MONTH	COURSE/ TOPIC	TEACHER	CLASS HOUR	TUTORIAL
July August	Object Oriented Programming Concept Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA	DP	DP-12	THEORYTICAL-10 PRACTICAL-6 TUTORIAL-1
	Introduction to Java: Features of Java, JDK Environment Java Programming Fundamental : Structure of java program, Data types, Variables, Operators	FA	FA-5	

September	,Keywords, Naming Convention, Decision Making (if, switch),Looping(for, while) ,Type Casting Classes and Objects: Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance,	DP	DP-14	THEORYTICAL-10 PRACTICAL-7 TUTORIAL-1
	Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes	FA		
October	Arrays and Strings: Arrays, Creating an array, Types of Arrays, String class Methods, StringBuffer methods.	DP	DP-5	THEORYTICAL-5 PRACTICAL-3 TUTORIAL-1
	Abstract Class, Interface and Packages: Modifiers and Access Control, Abstract classes and methods, Interfaces, Packages	FA		
November	Concept, Creating user defined packages Exception Handling: Exception types, Using try catch and multiple catch	DP	DP-2 FA-3	THEORYTICAL-3 PRACTICAL-1 TUTORIAL-1

	Nested try, throw, throws and finally, Creating User defined Exceptions.	FA		
December	Applet Programming: Introduction, Types Applet, Applet Life cycle, Creating Applet, Applet tag	DP	DP-8	THEORYTICAL-7 PRACTICAL-4 TUTORIAL-1
	File Handling: Byte Stream, Character Stream, File IO Basics, File Operations, Creating file, Reading file, Writing File	FA	FA-4	
		TOTAL	61	

Resources :

Books:

1. Ivan Bayross, Web Enabled Commercial Application Development Using Html, Dhtml,javascript, Perl Cgi , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication , 3rd Edition., 2009
3. Herbert Schildt , Java 7, The Complete Reference, , 8th Edition, 2009.
4. E Balagurusamy , Programming with JAVA, TMH, 2007

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

Sec-2

Paper Title- R programming

Paper Code- CMSSEEC02M

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
July August	Introduction: Overview and History of R, Getting Help, Data Types, Subsetting, Vectorized 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	FA	FA-4	THEORYTICAL-3 PRACTICAL-1
September	Operations, Reading and Writing Data 3. Write a program that prints a multiplication table for numbers up to 12. 4. Write a function that returns	FA	FA-5	THEORYTICAL-3 PRACTICAL-2

	<p>the largest element in a list.</p> <p>5. Write a function that computes the running total of a list.</p>			
October	<p>Control Structures, Functions, lapply, tapply, split, mapply, apply,</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>	FA	FA-2	<p>THEORYTICAL-1</p> <p>PRACTICAL-1</p>
November	<p>Coding Standards</p> <p>Scoping Rules,</p> <p>8. Implement linear search.</p> <p>9. Implement binary search.</p>	FA	FA-2	<p>THEORYTICAL-1</p> <p>PRACTICAL-1</p>
December	<p>Debugging Tools, Simulation, R Profiler.</p> <p>10. Implement matrices addition , subtraction and Multiplication</p>	FA	FA-3	<p>THEORYTICAL-2</p> <p>PRACTICAL-1</p>
		TOTAL	16	
		ALL TOTAL		

Resources :

Books:

1. W. N. Venables, D. M. Smith, An Introduction to R, Rcore team, 2015

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

Sec-1

Paper Title- Programming in Python

Paper Code- CMSSEEC01M

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
July August	<p>Planning the Computer Program: Concept of problem solving, Problem definition, Programdesign, Debugging, Types of errors in programming, Documentation.</p> <p>Techniques ofProblem Solving: Flowcharting, decision table, algorithms, Structured programming concepts,Programming methodologies viz. top-down and bottom-up programming.</p> <p>1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users 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. Assign grades according to the following</p>	FA	FA-5	THEORYTICAL-3 PRACTICAL-2

	<p>criteria :</p> <p>Grade A: Percentage ≥ 80 Grade B: Percentage ≥ 70 and < 80 Grade C: Percentage ≥ 60 and < 70 Grade D:</p> <p>Percentage ≥ 40 and < 60 Grade 1. Percentage < 40</p> <p>1 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>2 WAP to display the first n terms of Fibonacci series.</p> <p>3 WAP to find factorial of the given number.</p> <p>4 WAP to find sum of the following series for n terms: $1 - \frac{2}{2!} + \frac{3}{3!} - \dots - \frac{n}{n!}$</p>			
September	<p>Overview of Programming : Structure of a Python Program, Elements of Python</p> <p>5 WAP to calculate the sum and product of two compatible matrices</p> <p><i>All the programs should be written using user defined functions, wherever possible.</i></p> <p>4. Write a menu-driven program to create mathematical 3D objects I. curve 4. sphere</p> <p>III. cone IV. arrow 1. ring</p> <p>VI. cylinder. 1. WAP to read n integers and display them as a histogram. 2. WAP to display sine, cosine, polynomial and exponential curves</p>	FA	FA-4	THEORYTICAL-3 PRACTICAL-1
October	<p>Introduction to Python: Python Interpreter, Using Python as calculator, Python</p>	FA	FA-2	THEORYTICAL-1

	<p>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).</p> <p>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 $t \geq 0$.</p>			PRACTICAL-1
November December	<p>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.</p> <p>5. A population of 1000 bacteria is introduced into a nutrient 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</p>	FA	FA-2	THEORYTICAL-1 PRACTICAL-1
		TOTAL		
		ALL TOTAL		

Resources :

Books:

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. Python Tutorial/Documentation www.python.org 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/>