

BASIRHAT COLLEGE

DEPARTMENT OF COMPUTER SCIENCE

LESSON PLAN-2021-2022 JUL-DEC

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

Semester-I

Paper Title- Problem Solving with Computer

Paper Code- CMSGCOR01T

Credits-4

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
October	Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming. Overview of Programming: Structure of a Python Program, Elements of Python Introduction to Python: Python Interpreter, Using Python as	DP	DP-16 FA-6	THEORYTICAL-12 PRACTICAL-8 TUTORIAL-2

	<p>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 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>Computer Fundamentals: Introduction to Computers: Characteristics of Computers, Uses of computers, Types and</p>			

	<p>generations of Computers. Basic Computer Organization - Units of a computer, CPU, ALU, memory hierarchy, registers, I/O devices.</p> <p>Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.</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 – 2/2! + 3/3! - - - - - n/n!</p> <p>7. WAP to calculate the sum and product of two compatible matrices.</p>	FA		
November	<p>Creating Python Programs: Input and Output Statements, Control statements (Looping-whileLoop, for Loop , Loop Control,</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>	DP	DP-14 FA-8	<p>THEORYTICAL-14 PRACTICAL-6 TUTORIAL-2</p>

	<p>Conditional Statement- if...else, Difference between break, continue and pass).</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>	FA		
December	<p>Introduction to Advanced Python: Objects and Classes, Inheritance, Regular Expressions, Event Driven Programming, GUI Programming.</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> <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		<p>THEORYTICAL-18 PRACTICAL-8 TUTORIAL-2</p>
	<p>Structures: Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules, Defining Functions, Exit function, default arguments.</p> <p>7. Input initial velocity and acceleration, and plot the</p>	FA	DP-20 FA-8	

	following graphs depicting equations of motion: I. velocity wrt time ($v=u+at$) II. distance wrt time ($s=ut+0.5at^2$) III. distance wrt velocity ($s=(v^2-u^2)/2a$)			
		TOTAL	72	

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

Credits-4

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
September	<p>Introduction: System Software, Resource Abstraction, OS strategies.</p> <p>Operating System Organization: Factors in operating system design, basic OS functions, implementation</p> <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</p>	DP	DP-14 FA-12	THEORYTICAL-16 PRACTICAL-8 TUTORIAL-2

	<p>commands:</p> <p>cal, cat(append), cat(concatenate), mv, cp, man, date.</p> <p>3. Usage of following commands:</p> <p>chmod, grep, tput (clear, highlight), bc.</p>			
	<p>Types of operating systems - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems.</p> <p>consideration; process modes, methods of requesting system services – system calls and system programs.</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>	FA		
October	<p>Process Management : System view of the process and resources, initiating the OS, processaddress space,</p>	DP	<p>DP-8 FA-8</p>	<p>THEORYTICAL- 8 PRACTICAL-6 TUTORIAL-2</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>process abstraction, resource abstraction, process hierarchy, Thread model</p> <p>10. Write a shell script to 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>	FA		
November	<p>Scheduling: Scheduling Mechanisms, Strategy selection,</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>	DP	DP-10 FA-8	THEORYTICAL-10 PRACTICAL-6 TUTORIAL-2

	<p>non-pre-emptive and pre-emptive strategies.</p> <p>16. Write a shell script to find the power of a given number. 17. Write a shell script to find the factorial of a given number.</p>	FA		
December	<p>Shell introduction and Shell Scripting</p> <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 ● Pipes and Filters ● Decision making in Shell Scripts (If else, switch), Loops in shell ● Functions ● Utility programs (cut, paste, join, tr , uniq utilities) ● Pattern matching utility (grep) <p>18. Write a shell script to check whether the number is Armstrong or not. 19. Write a shell script to check whether the file have all the permissions or not.</p>	DP	DP-10 FA-12	<p>THEORYTICAL-12 PRACTICAL-8 TUTORIAL-2</p>

	<p>Memory Management: Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory</p> <p>20. Program to show the pyramid of special character “*”</p>	FA		
		TOTAL	82	

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
September	Introduction to Java: Features of Java, JDK Environment Object Oriented Programming Concept Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference	DP	DP-18 FA-16	THEORYTICAL- 20 PRACTICAL-12 TUTORIAL-2

	between C++ and JAVA			
	Java Programming Fundamental :Structure of java program, Data types, Variables, Operators,Keywords, Naming Convention, Decision Making (if, switch),Looping(for, while) ,Type Casting	FA		
October	Arrays and Strings: Arrays, Creating an array, Types of Arrays, String class Methods, StringBuffer methods.	DP	DP-10 FA-12	THEORYTICAL-12 PRACTICAL-8 TUTORIAL-2
	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	FA		
November	Abstract Class, Interface and Packages: Modifiers and Access Control, Abstract classes and methods, Interfaces, Packages Concept, Creating user defined packages	DP	DP-12 FA-10	THEORYTICAL-12 PRACTICAL-8 TUTORIAL-2
	Exception Handling: Exception types, Using try catch and multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions.	FA		
December	File Handling: Byte Stream, Character Stream, File IO	DP	DP-14 FA-14	THEORYTICAL-16

	Basics, File Operations, Creating file, Reading file, Writing File			PRACTICAL-10 TUTORIAL-2
	Applet Programming: Introduction, Types Applet, Applet Life cycle, Creating Applet, Applet tag	FA		
		TOTAL	106	

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- CMSSECO2M

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
September	<p>Introduction: Overview and History of R, Getting Help, Data Types, Subsetting, Vectorized</p> <p>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.</p>	FA	FA-4	THEORYTICAL-3 PRACTICAL-1
October	Operations, Reading and	FA	FA-3	THEORYTICAL-

	<p>Writing Data.</p> <p>4. Write a function that returns the largest element in a list.</p> <p>5. Write a function that computes the running total of a list.</p>			<p>2</p> <p>PRACTICAL-1</p>
November	<p>Control Structures, Functions, lapply, tapply, split, mapply, apply, Coding Standards.</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>
December	<p>Scoping Rules, Debugging Tools, Simulation, R Profiler.</p> <p>8. Implement linear search.</p> <p>9. Implement binary search.</p> <p>10. Implement matrices addition, subtraction and Multiplication</p>	FA	FA-3	<p>THEORYTICAL-2</p> <p>PRACTICAL-1</p>
		TOTAL	12	

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- CMSSECO1M

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
September	<p>Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.</p> <p>Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.</p>	FA	FA-4	THEORYTICAL-3 PRACTICAL-1

	<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 criteria :</p> <p>Grade A: Percentage ≥ 80 Grade B: Percentage ≥ 70 and < 80 Grade C: Percentage ≥ 60 and < 70 Grade D: Percentage ≥ 40 and < 60</p> <p>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>			
October	<p>Overview of Programming : Structure of a Python Program, Elements of Python</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: $1 - 2/2! + 3/3! - \dots - n/n!$</p> <p>5 WAP to calculate the sum and product of two compatible matrices.</p>	FA	FA-2	THEORYTICAL-1 PRACTICAL-1

November	<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>4. Write a menu-driven program to create mathematical 3D objects I. curve 4. sphere 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> <p>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 $t \geq 0$. 5. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows:</p> <p>$P(t) = (15000(1+t))/(15+ e)$ where the time t is measured in hours. WAP to determine</p>	FA	FA-2	THEORYTICAL-1 PRACTICAL-1
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	the size of the population at given time t and plot a graph for P vs t for the specified time interval.			
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>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)</p>	FA	FA-3	THEORYTICAL-2 PRACTICAL-1
		TOTAL	11	

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/>

