

BASIRHAT COLLEGE

DEPARTMENT OF COMPUTER SCIENCE

LESSON PLAN-2023-2024 JULY-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 . be familiar with fundamental programming concepts and methodology (variables, assignments, conditions, branches, loops, functions, recursions, structures);

CO2 . be familiar with and appreciate good programming practice, and apply it to follow-up courses;

CO3 . be able to apply problem-solving knowledge and skills to write small, well documented, effective C programs;

CO4 . be able to appreciate the use of simple data structure such as array, know their limitations to pave way for more complex data structures in the next course;

CO5 . know the responsibilities of an ethical programmer;

MONTH	COURSE/ TOPIC	TEACHER	CLASS HOUR	TUTORIAL
July August	Overview of C History, Basic Structure, Algorithms, Structured programming constructs. Character sets, Tokens, Keywords, 1. Write a program (WAP) to print the sum and product of digits of an integer. 2. WAP to reverse a non-negative integer. 3. WAP to compute the sum of the first n terms of the following series $S = 1+1/2+1/3+1/4+.....$ 4. WAP to compute the sum of the first n terms of the following series,	DP	DP-4 FA-6	THEORYTICAL-4 PRACTICAL -2 TUTORIAL -4

	<p>S = 1-2+3- 4+5.....</p> <p>Operators, Expressions and Preprocessor (8 Lectures)</p> <p>Arithmetic, Relational, Logical and Assignment; Increment and Decrement and Conditional, Bitwise, Special</p> <p>operator, Operator Precedence and Associativity; Arithmetic Expressions, Evaluation of expression, type casting.</p> <p>9. WAP to print a triangle of stars as follows (take number of lines from user):</p> <pre>* *** ***** ***** *****</pre> <p>10. WAP to perform following actions on an array entered by the user :</p> <ol style="list-style-type: none"> Print the even-valued elements Print the odd-valued elements Calculate and print the sum and average of the elements of array Print the maximum and 			
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	<p>minimum element of array</p> <p>e. Remove the duplicates from the array</p> <p>f. Print the array in reverse order</p> <p>(The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter array and to quit the program.)</p> <p>Constants, Variables, Data Types, Declaration of storage classes.</p> <p>5. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.</p> <p>6. Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by the user is Palindrome or not.</p> <p>7. WAP to compute the factors of a given number.</p> <p>8. WAP to swap two numbers using macro.</p> <p>Comments, Input and output operations. Understanding the Preprocessor Directives (#include, #define, #error, #if, #else, #elif, #endif, #ifdef, #ifndef and #undef), Macros</p> <p>11. WAP that prints a table</p>	<p>FA</p>		
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	<p>indicating the number of occurrences of each alphabet in the text</p> <p>entered as command line arguments.</p> <p>12. Write a program that swaps two numbers using pointers.</p> <p>13. Write a program in which a function passes the address of two variables and then alter its contents.</p> <p>14. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.</p> <p>15. Write a program to find the sum of n elements entered by the user. To write this program, allocate memory dynamically using malloc() / calloc() functions or new operators.</p>			
<p>September October</p>	<p>Decision and Loop Control Structure (7 Lectures) If-else statements, Nested if-else, switch, Conditional operator. While, do-While, 16. Write a menu driven</p>	<p>DP</p>	<p>DP-10 FA-8</p>	<p>THEORYTICAL-8 PRACTICAL -6 TUTORIAL -4</p>

	<p>program to perform following operations on strings:</p> <ol style="list-style-type: none"> Show address of each character in string Concatenate two strings without using strcat function. Concatenate two strings using strcat function. Compare two strings Calculate length of the string (use pointers) Convert all lowercase characters to uppercase Convert all uppercase characters to lowercase Calculate number of vowels Reverse the string <p>for loop, break statements, continue statements, goto statements.</p> <p>17. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.</p> <p>18. WAP to display Fibonacci series (i) using recursion, (ii) using iteration.</p> <p>19. WAP to calculate Factorial of a number (i) using recursion, (ii) using iteration.</p>	FA		
November	<p>Functions and Utility of functions, Call by Value, Call by Reference, Functions returning value, Void functions, Inline Functions, Return data type of functions, Functions parameters, Differentiating between Declaration and Definition of Functions, Command Line Arguments/Parameters in Functions, Functions with</p>	DP	DP-18 FA-10	THEORYTICAL-14 PRACTICAL -10 TUTORIAL -4

	<p>variable number of Arguments. Creating and Using One Dimensional Arrays (Declaring and Defining an Array, Initializing an Array, Accessing 20. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion. 21. Write a menu-driven program to perform following Matrix operations (2-D array implementation): a) Sum b) Difference c) Product d) Transpose</p> <p>individual elements in an Array, Manipulating array elements using loops), Use Various types of arrays (integer, float and character arrays / Strings) Two-dimensional Arrays (Declaring, Defining and Initializing Two Dimensional Array, Working with Rows and Columns), Introduction to Multi-dimensional arrays, return statement, return values and their types, String handling with arrays, String handling 22. Copy the contents of one text file to another file, after removing all whitespaces. 23. Write a function that reverses the elements of an array in place. The function must accept only one pointer value and return void.</p>			
December	<p>Pointers Definition and initialization, Pointer arithmetic, Pointers and arrays, String functions and manipulation, Dynamic storage allocation. User defined Datatypes</p>	DP	DP-24 FA-8	THEORYTICAL-12 PRACTICAL -14 TUTORIAL -6

	<p>and Memory Allocation Enumerated datatypes, Structures. Structure arrays, Pointers to Functions and Structures, Unions. Differentiating between static and dynamic memory allocation, use of malloc, calloc and free functions, 24. Write a program that will read 10 integers from the user and store them in an array. Implement an array using pointers. The program will print the array elements in ascending and descending order. 25. Add two distances in a meter kilometer system using structure.</p> <p>use of new and delete operators, storage of variables in static and dynamic memory allocation</p> <p>File Access Opening and closing a file (use of fstream header file, ifstream, ofstream), Reading and writing Text Files, Using put(), get(), read() and write() functions, Random access in files,</p> <p>26. Add two complex numbers using structures. 27. Calculate the difference between two time periods using structures.</p>	FA		
		TOTAL	88	
		ALL TOTAL		

Resources :

Books:

1. The C Programming Language, Kernighan and Dennis Ritchie, PHI.
2. The Complete reference C, Herbert Schildt, McGraw Hill.
3. Programming Languages, Allen B. Tucker, Tata McGraw Hill.

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
July	<p>Introduction: System (2L) Software, Resource Abstraction, OS strategies.</p> <p>Types of operating systems - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems.</p>	<p>DP</p> <p>FA</p>	<p>DP-4</p> <p>FA-4</p>	<p>THEORYTICAL-3</p> <p>PRACTICAL -1</p> <p>TUTORIAL -4</p>
August	<p>Operating System (10L) Organization: Factors in operating system design, basic OS functions,implementation consideration; process modes,</p> <p>methods of requesting system services – system calls and system programs.</p>	<p>DP</p> <p>FA</p>	<p>DP-10</p> <p>FA-15</p>	<p>THEORYTICAL-12</p> <p>PRACTICAL -8</p> <p>TUTORIAL -5</p>
September	<p>Process Management : System view of the process and</p>	<p>DP</p>	<p>DP-10</p> <p>FA-19</p>	<p>THEORYTICAL-17</p> <p>PRACTICAL -</p>

	<p>resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model</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 commands: cal, cat(append), cat(concatenate), mv, cp, man, date.</p> <p>Scheduling: Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies.</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</p>			<p>10 TUTORIAL -2</p>
October	<p>Scheduling: Scheduling Mechanisms, Strategy selection,</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>	DP	<p>DP-4 FA-4</p>	<p>THEORYTICAL-3 PRACTICAL -1 TUTORIAL -4</p>

	<p>non-pre-emptive and pre-emptive strategies.</p> <p>7. Write a shell script to accept a login name. If not a valid login name display message – “Entered logic name is invalid”.</p> <p>8. Write a shell script to display date in the mm/dd/yy format.</p>	FA		
November	<p>Memory Management: Mapping address space to memory space, memory allocation</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>strategies, fixed partition, variable partition, paging, virtual memory</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>DP</p> <p>FA</p>	<p>DP-6 FA-16</p>	<p>THEORYTICAL-10 PRACTICAL -8 TUTORIAL -6</p>
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 	DP	<p>DP-8 FA-20</p>	<p>THEORYTICAL-16 PRACTICAL -10 TUTORIAL -2</p>

	<p>and executing the shell script</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</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> <ul style="list-style-type: none"> ● 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>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>	FA		
		TOTAL	102	
		ALL TOTAL		

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	<p>Introduction to Java: (2L) Features of Java, JDK Environment</p> <p>Object Oriented Programming Concept Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA</p>	<p>DP FA</p>	<p>DP-4 FA-4</p>	<p>THEORYTICAL-3 PRACTICAL -1 TUTORIAL -4</p>
August	<p>Java Programming Fundamental :Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch), Looping (for, while), Type Casting (12L)</p> <p>Classes and Objects: Creating Classes and objects, Memory allocation for objects</p> <p>Implementation of Inheritance, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes</p>	<p>DP FA</p>	<p>DP-12 FA-10</p>	<p>THEORYTICAL-10 PRACTICAL -6 TUTORIAL -6</p>
September	<p>Arrays and Strings: Arrays,</p>	<p>DP FA</p>	<p>DP-8 FA-10</p>	<p>THEORYTICAL-10</p>

	Creating an array, Types of Arrays, String class Methods, StringBuffer methods. (8L) Abstract Class, Interface and Packages: Modifiers and Access Control, Abstract			PRACTICAL -6 TUTORIAL -2
October November	methods, Interfaces, Packages Concept, Creating user defined packages Exception Handling: Exception types, Using try catch and multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions.	DP FA	DP-8 FA-12	THEORYTICAL-10 PRACTICAL -8 TUTORIAL -2
December	File Handling: Byte Stream, Character Stream, File IO Basics, File Operations, Creating file, Reading file, Writing File Applet Programming: Introduction, Types Applet, Applet Life cycle, Creating Applet, Applet tag	DP FA	DP-10 FA-10	THEORYTICAL-8 PRACTICAL -7 TUTORIAL -5
		TOTAL	88	
		ALL TOTAL		

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