DEPARTMENT OF COMPUTER SCIENCE, EGRA S.S.B. COLLEGE, EGRA 721429
PROGRAM OUTCOME(PO), COURSE OUTCOME(CO), AND PROGRAMME SPECIFIC OUTCOME(PSO) FOR END SEMESTER STUDENTS: UNDERGRADUATE COURSE

PROGRAMME NAME: B.SC. GENERAL (COMPUTER SCIENCE)

PROGRAMME OUTCOMES

At the end of the B.Sc. (Computer Science) programme, graduates will able to

PO	Summary	Description
PO1	Problem Solving using Computer and Computer Fundamental and Introduction to Programming	This course is for learning about the programming languages mostly python and to increase the computational thinking using Python. The concept of basic programming paradigms and to develop the concept of algorithmic solutions to simple computational programs.
PO2	Database Management system and Introduction to Database System	DBMS is a software package designed to define, manipulate, retrieve and manage data in database. This course will facilitates the management of data in a highly organized manner.
PO3	Operating System	Ability to study fundamentals of software and hardware as well as memory and processes. It also allows you how to communicate with the computer. Without an OS a computer system is useless.
PO4	Computer system Architecture	Computer architecture is at the interface of computer hardware and software. It will span many dimensions, such as the characteristics of the design objectives (speed, power consumption, cost, reliability, availability and reconfigurability), scope of processors etc.
PO5	Software Engineering	Ability to develop concept about the design, development, testing and maintenance of software applications. Ability to have knowledge about software engineering principles and knowledge of programming languages to build software solutions for end users.
PO6	Ecommerce Technology	Ability to understand the market demand. Enabling the age of technology. A perfect experience of technology and adapting the future demand as developer.
PO7	Programming in Python	Simple programming techniques and also introduce with array linked list etc. Work with user input to create fun and interactive programs. Create simple games with images, animations, and audio using our custom beginner-friendly programming library, Wizardlib.
PO8	HTML Programming and PHP programming and XML programming	HTML's primary purpose is to display content, given in a text-based document, in a graphical form in the browser. In contrast, XML allows different applications to exchange and

| PO9 | Programming with Matlab | To analyze and design systems and products that transform our world. The heart of MATLAB is the MATLAB language, a matrix-based language allowing the most natural expression of computational mathematics. |
| PO7 | Individual & Team work | Ability to work as a member or leader in diverse terms in a multi-disciplinary environment. |

| | | store data and its structure in a way that is universally understood.
PHP programming generate dynamic page content and can create, open, read, write, delete, and close files on the server. This can collect data from forms and can send and receive cookies. This file can also add, delete and modify data in your database. |

PROGRAMME SPECIFIC OUTCOMES (PSO) :: B.Sc. COMPUTER SCIENCE

PSO	Summary	Description
PSO1:	Problem Solving using Computer and Computer Fundamental and Introduction to Programming and Programming in Python	The process of identifying a problem, developing an algorithm for the identified problem and lastly implementing the algorithm to develop a computer program is basically the problem solving using computers. Hence Python programming language is widely used general purpose programming language. So, It is used in developing websites, and software automate tasks and it is also used for data analysis. A few of many topics/modules that they will learn in this programme are: Basics of object oriented programming languages, understanding algorithms to solve any simple or complex problems, Some python programming paradigms , knowledge about python programming execution methods and many more.
PSO2:	Database Management system and Introduction to Database System	Database Management System are software system used to store, retrieve, and run queries on data. It helps to grow the knowledge about organizing data methodically and at the same time the student will learn to handle data storage, backup and reporting, multi-access control and security via the DBMS software.
PSO3:	Operating System	Ability to learn about the basic fundamentals of hardware and software and interface between software and users. Operating system Gives a knowledge about system software and students learn to work with Command Line Interfaces. It will improve their working ability with both graphical user Interface as well as Command Line Interface. An Operating System manages all of the other application program in a

		computer.
PSO4:	Computer system Architecture	Computer Architecture is defined as the end-to end structure of a computer system that determines how its components interact with each other in helping execute the machine purpose. In computer engineering computer architecture is the structure of a computer system made from component parts. Students acquire knowledge about processors. Learn about different gates, instruction fetch, instruction decode, memory, write-back etc.
PSO5:	Software Engineering and HTML Programming and PHP programming and XML programming	Software engineering is the branch of Computer Science that deals with the design, development, testing ,and maintenance of software applications. Apply software engineering practices and strategies to develop software projects using some designing tools and learn to create a demonstration model to deliver a quality product for business success.
PSO6:	Ecommerce Technology	E-commerce technology is basically buying selling goods, or making some transactions over an electronic network. Making a software project on ecommerce technology using open source programming environment will help students to understand the market demand and will be an opportunity to gather innovative idea to solve customer's expectations
PSO7:	Programming with Matlab	Ability to learn object oriented programming programing paradigm. Matlab has inbuilt mathematical library functions so that it will help students to solve mathematical analysis of data.The inbuilt graphics feature will enhance their knowledge and experience.
PSO8:	Individual & Team work	Students will be able to learn various issues related to technology, latest trend in programming languages and as well as innovative new ideas and solutions to any existing problems.

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COURSE OUTCOMES(CO) FOR B.Sc. GENERAL STUDENTS:

CO	PAPER & SUBJECTS	DESCRIPTIONS
CO1:	(Paper: DSC-1A Problem Solving using Computer)	• Students will be familiar with fundamental of computers and also will be able to know about basic computer organization. Learn about basic concepts of Object-Oriented Programming. • Grow concepts on problem solving techniques and at the same time they will learn about the types of errors. • Students will gain an overview of programming concept with python programming
CO2:	(Paper: DSC-1B Database Management system)	• Helps in Understanding Database approach . • Students will be acquainted with relational models which will help them to design a more reliable project and they will also learn the technique of organizing data • They will understand about the benefits of DBMS and will be able to implement a better software project later on.
CO3:	(Paper: DSC-1C Operating System)	• Helps in understanding the facts about software. • To enable students to encompass the fundamentals of system software mostly operating system. • They will acquaint with the scheduling mechanism. • They will learn to use Command Line Interface and will be able to choose their preferable platform for working with
CO4:	(Paper: DSC-1D Computer system Architecture)	• Helps in understanding the basic computer organization and design. • Students will get to know about the organization of registers and logical micro-operation that will help them to understand more about Central Processing Unit. • Students will gain the knowledge on peripheral devices, I/O interfaces, Modes of data transfer etc.
CO5:	(Paper: DSE-1 Software Engineering)	• Students will acquaint with S/W Engineering paradigm which is very necessary for a software designer. • The design concepts and the principles will help them to grow concepts on modular design. • Students will gather knowledge about project

CO		DESCRIPTIONS
		scheduling as well as they will be able measure and estimate the duration and cost of developing a project respectively.
CO6:	: (Paper: DSE-2 E-commerce Technology)	• Helps to gather knowledge about electronic commerce and students will be fully able to understand technical components of E-Commerce. • It will help them to gather knowledge about internet marketing. • Students will develop their ability to evaluate, utilize and implement in developing websites.

COURSE OUTCOMES(CO) FOR GENERIC ELECTIVE AND SKILL ENHANCEMENT COURSE STUDENTS:

CO	PAPER & SUBJECTS	DESCRIPTIONS
CO7:	(Paper: GE-1: Computer Fundamentals)	• After successfully completing this course, a student will be able to Converse in basic computer terminology. • Enables Formulate opinions about the impact of computers on society. • To understand basics of computer and working with OS.
CO8:	(Paper: GE-2: Introduction to Database System)	• At the end of the course, the students will be able to Understand the basic concepts and the applications of database systems. • Master the basics of SQL and construct queries using SQL. • Understand the relational database design principles.
CO9:	(Paper: GE-3: Introduction to Programming)	• Understanding foundation concepts of information and information processing in computer systems a matter of information, data representation, coding systems. • Understanding of an algorithm and its definition. • Understanding of a programming language syntax and its definition by example of C language. • Develop concept of object-oriented programming via learning C++. • Students will be able to differentiate between procedural programming approach and Object-Oriented Programming approach.
CO10:	(Paper: GE-4: Programming in Python)	• After fully completion of this course Students will able to gather an overview of the various tools available for writing and running Python, and which will help students coding quickly.

		• The course enables students the essential concepts of Python programming, and gives an in-depth knowledge in programming field. • Students will learn the iteration technique.
CO11:	**(Paper: SEC-1: HTML Programming)**	• Define HTML and common terminology related to HTML. Recognize correct HTML syntax. Be able to write a brief, error-free HTML code. • Author webpages with well-structured HTML and correct CSS layout/styling patterns. • Personalize web pages using text formatting, graphics, audio, and video elements.
CO12:	**(Paper: SEC-2: PHP Programming)**	• After fully completion of this course Students will able to gather an overview of the various tools available for writing and running Python, and which will help students coding quickly. • The course enables students the essential concepts of Python programming, and gives an in-depth knowledge in programming field. • Students will learn the iteration technique.
CO13:	**(Paper: SEC-3: Programming with Matlab)**	• To Use MATLAB effectively to analyze and visualize data. • Apply numeric techniques and computer simulations to solve engineering-related problems. • To Understand Basics of MATLAB coding. Write the program for a given problem in MATLAB coding. • Simulate various electric circuits in MATLAB simulation tool.
CO14:	**(Paper: SEC-4: XML Programming)**	• Students will learn the basics of creating XML documents, transforming XML documents, and validating XML documents. More specifically, they will learn the basics and history of XML and how to write own XML documents.

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OUTLINE SYLLEBUS OF UG (GENERAL) COURSES DEPARTMENT OF COMPUTER SCIENCE

<u>CORE COURSES</u>

DSC-1A (CC-1): Problem Solving using Computers Credits 06

DSC1AT: Problem Solving using Computers Credits 04

Course Contents:

Unit I: Computer Fundamentals: Introduction to Computers: Characteristics of Computers, Uses of computers, Types and generations of Computers.

Unit II: Basic Computer Organization - Units of a computer, CPU, ALU, memory hierarchy, registers, I/O devices. Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.

Unit III: Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.

Unit IV: 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). 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).

Unit V: Structures: Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules, Defining Functions, Exit function, default arguments.

Unit VI: Introduction to Advanced Python: Objects and Classes, Inheritance, Regular Expressions, Event Driven Programming, GUI Programming.

DSC1AP: Software Lab using Python(Lab) Credits 02

Practical Section: A (Simple programs)

 1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's 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 =60 and =40 and

Grade C: Percentage>=60 and =40 and

Grade D: Percentage>=40 and

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.

4. WAP to display the first n terms of Fibonacci series. 5. WAP to find factorial of the given number. 6. WAP to find sum of the following series for n terms: 1 – 2/2! + 3/3! - - - - - - n/n! 7. WAP to calculate the sum and product of two compatible matrices.

5. WAP to find factorial of the given number.

6. WAP to find sum of the following series for n terms: $1 - 2/2! + 3/3! - - - - - n/n!$

7. WAP to calculate the sum and product of two compatible matrices.

Section: B (Visual Python):

All the programs should be written using user defined functions, wherever possible.

1. Write a menu-driven program to create mathematical 3D objects I. curve II. sphere III. cone IV. arrow V. ring VI. Cylinder.

 2. WAP to read n integers and display them as a histogram.

 3. WAP to display sine, cosine, polynomial and exponential curves.

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.

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 $t>=0$.

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.

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 (s=(v*v-u*u)/2*a)

DSC-1B (CC-2): Database Management Systems Credits 06

 DSC1BT: Database Management Systems Credits 04

Course Contents:

Unit I: Introduction to Database Management Systems: Characteristics of database approach, data models, DBMS architecture and data independence.

Unit II: **Entity Relationship and Enhanced ER Modeling:** Entity types, relationships, SQL- 99:Schema Definition , constraints, and object modeling.

Unit III: Relational Data Model : Basic concepts, relational constraints, relational algebra, SQL queries.

Unit IV: Database design: ER and EER to relational mapping, functional dependencies, normal forms up to third normal form.

DSC1BP: Software Lab based on Database Management Systems (Lab) Credits 02

Practical Note: MyAccess/MySQL may be used. The following concepts must be introduced to the students:

DDL Commands

• Create table, alter table, drop table

DML Commands

 • 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 (join on different and same tables)

 • 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

DSC-1C (CC-3): Operating Systems Credits 06

DSC1CT: Operating Systems Credits 04

Course Contents:

Unit I: Introduction: System Software, Resource Abstraction, OS strategies.

Unit II: Types of operating systems - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems.

Unit III: 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.

Unit IV: Process Management : System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model

Unit V: Scheduling: Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies.

Unit VI: Memory Management: Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory Shell introduction and

Unit VII: Shell Scripting

¬ 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)

DSC1CP: Software Lab based on Operating Systems (Lab) Credits 02

Practical Note: Following exercises can be performed using Linux or Unix

1. Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd.

2. Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man, date.

3. Usage of following commands: chmod, grep, tput (clear, highlight), bc.

4. Write a shell script to check if the number entered at the command line is prime or not.

5. Write a shell script to modify "cal" command to display calendars of the specified months.

6. Write a shell script to modify "cal" command to display calendars of the specified range of months.

7. Write a shell script to accept a login name. If not a valid login name display message – "Entered login name is invalid".

8. Write a shell script to display date in the mm/dd/yy format.

9. Write a shell script to display on the screen sorted output of "who" command along with the total number of users .

10. Write a shell script to display the multiplication table any number,

11. Write a shell script to compare two files and if found equal asks the user to delete the duplicate file. 12. Write a shell script to find the sum of digits of a given number.

13. Write a shell script to merge the contents of three files, sort the contents and then display them page by page.

14. Write a shell script to find the LCD (least common divisor) of two numbers.

15. Write a shell script to perform the tasks of basic calculator.

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.

DSC-1D (CC-4): Computer System Architecture Credits 06

DSC1DT: Computer System Architecture Credits 04

Course Contents:

Unit I: Introduction: Logic gates, boolean algebra, combinational circuits, circuit simplification, flipflops and sequential circuits, decoders, multiplexors, registers, counters and memory units.

Unit II: Data Representation and basic Computer Arithmetic: Number systems, complements, fixed and floating point representation, character representation, addition, subtraction, magnitude comparison.

Unit III: Basic Computer Organization and Design: Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference, input-output and interrupt.

Unit IV: Central Processing Unit: Register organization, arithmetic and logical micro-operations, stack organization, micro programmed control.

Unit V: Programming the Basic Computer: Instruction formats, addressing modes, instruction codes, machine language, assembly language, input output programming.

Unit VI : Input-output Organization: Peripheral devices, I/O interface, Modes of data transfer, direct memory access.

DSC1DP: Computer System Architecture Lab Credits 02

Practical:

Microprocessor

Discipline Specific Elective (DSE)

DSE-1:

Programming in Java (Credits 06)

DSE1T: Programming in Java (Credits 04)

Course Contents:

Unit-I : Introduction to Java: Features of Java, JDK Environment,

Unit-II : Object Oriented Programming Concept: Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA

Unit-III : Java Programming Fundamental : Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch),Looping(for, while) ,Type Casting

Unit-IV : 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

Unit-V :Arrays and Strings: Arrays, Creating an array, Types of Arrays, String class Methods, String Buffer methods.

Unit-VI :Abstract Class, Interface and Packages: Modifiers and Access Control, Abstract classes and methods, Interfaces, Packages Concept, Creating user defined packages.

Unit-VII :Exception Handling: Exception types, Using try catch and multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions.

Unit-VIII :File Handling: Byte Stream, Character Stream, File IO Basics, File Operations, Creating file, Reading file, Writing File

Unit-IX : Applet Programming: Introduction, Types Applet, Applet Life cycle, Creating Applet, Applet tag

DSE1P: Software Lab based on Java (Lab) Credits 02

Practical 1. WAP to find the largest of n natural numbers. 2. WAP to find whether a given number is prime or not. 3. Write a menu driven program for following: a. Display a Fibonacci series b. Compute Factorial of a number c. WAP to check whether a given number is odd or even. d. WAP to check whether a given string is palindrome or not. 4. WAP to print the sum and product of digits of an Integer and reverse the Integer. 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. 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. 7. Write a program in java to input N numbers in an array and print out the Armstrong numbers from the set. 8. Write java program for the following matrix operations: a. Addition of two matrices b. Summation of two matrices c. Transpose of a matrix d. Input the elements of matrices from user. 9. Write a java program that computes the area of a circle, rectangle and a Cylinder using function overloading. 10. Write a Java for the implementation of Multiple inheritance using interfaces to calculate the area of a rectangle and triangle. 11. Write a java program to create a frame window in an Applet. Display your name, address and qualification in the frame window. 12. Write a java program to draw a line between two coordinates in a window. 13. Write a java program to display the following graphics in an applet window. a. Rectangles b. Circles c. Ellipses d. Arcs e. Polygons 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 Number Format Exception object. After that ex. getMessage() prints the information about the error occurring causes. 15. Write a program for the following string operations: a. Compare two strings b. Concatenate two strings c. Compute length of a string 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.

Or

DSE-1: Discrete Structures Credits 06 DSE1T:

Discrete Structures Course Contents:

Unit-I: Introduction:

Introduction to Sets, Finite and Infinite Sets, Unaccountably Infinite Sets. Introduction to Functions and relations, Properties of Binary relations, Closure, Partial Ordering Relations.

Unit-II: Pigeonhole Principle, Permutation and Combinations, Mathematical Induction, Principle of Inclusion and Exclusion.

Unit-III: Asymptotic Notations Recurrence Relations: Introduction, Generating Functions, Linear Recurrence Relations with constant coefficients and their solution.

Unit-IV: Graphs Theory: Basic Terminology of Graphs, Models and Types, Multigraphs, Weighted Graphs, Graph Representation. Graph Isomorphism Graph Connectivity, Euler and Hamiltonian Paths and Circuits, Planar Graphs, Graph Colouring, Basic Terminology of Trees, Properties of Trees, Spanning Trees.

Unit-V: Inference Theory: Introduction, Logical Connectives, Well Formed Formulas, Tautologies, Equivalence .

Or

DSE-1: Analysis of Algorithm and Data Structures (Credits 06) DSE1T: Analysis of Algorithm and Data Structures Credits 04 Course Contents:

Unit-I: Introduction: Basic Design and Analysis techniques of Algorithms, Correctness of Algorithm

Unit-II: Algorithm Design Techniques: Iterative techniques, Divide and Conquer, Dynamic Programming, Greedy Algorithms.

Unit-III: Sorting Techniques: Elementary sorting techniques-Bubble Sort, Insertion Sort, Merge Sort, Advanced Sorting Techniques-Heap Sort, Quick Sort, Sorting in Linear Time-Bucket Sort, Radix Sort and Count Sort

Unit-I V: Searching Techniques: Linear and Binary search.

Unit-V: Complexity Analysis: Medians & Order Statistics.

Unit-VI: Data Structures: 1. Arrays Single and Multi-dimensional Arrays, Sparse Matrices 2. Stacks Implementing stack using array and linked list, Prefix, Infix and Postfix expressions, Utility and conversion of these expressions from one to another; 3. Queues Array and Linked representation of Queue, De-queue, Priority Queues 4. Linked Lists Singly, Doubly and Circular Lists, representation of Stack and Queue as Linked Lists. 5. Recursion Developing Recursive Definition of Simple Problems and their implementation; Advantages and Limitations of Recursion; 6. Trees Introduction to Tree as a data structure; Binary Trees, Binary Search Tree, (Creation, and Traversals of Binary Search Trees)

DSE1P: Software Lab based on Analysis of Algorithms (Lab) Credits 02 Practical: 1. Implement Insertion Sort (The program should report the number of comparisons) 2. Implement Merge Sort (The program should report the number of comparisons) 3. Implement Heap Sort (The program should report the number of comparisons) 4. Implement Randomized Quick sort (The program should report the number of comparisons) 5. Implement Radix Sort. 6. Implement Searching Techniques 7. Implementation of Recursive function. 8. Array and Linked list implementation of Stack and Queue. 9. Implementation of Single, Double and circular Linked List 10. Creation and traversal of Binary Search Tree.

Or

DSE-1: Software Engineering Credits 06 DSE1T: Software Engineering Credits 04 Course Contents:

Unit-I: Software Process: Introduction, S/W Engineering Paradigm, life cycle models (water fall, incremental, spiral, evolutionary, prototyping, object oriented), System engineering, computer-based system, verification, validation, life cycle process, development process, system engineering hierarchy.

Unit-II: Software requirements: Functional and non-functional, user, system, requirement engineering process, feasibility studies, requirements, elicitation, validation and management, software prototyping, prototyping in the software process, rapid prototyping techniques, user interface prototyping, S/W document. Analysis and modelling, data, functional and behavioural models, structured analysis and data dictionary.

Unit-III: Design Concepts and Principles: Design process and concepts, modular design, design heuristic, design model and document, Architectural design, software architecture, data design, architectural design, transform and transaction mapping, user interface design, user interface design principles. Real time systems, Real time software design, system design, real time executives, data acquisition system, monitoring and control system. Software **Unit-**

Unit-IV: Configuration Management: The SCM process, Version control, Change control, Configuration audit, SCM standards.

DSE1P: Software Engineering (Lab) Credits 02 Practical 1. Practical Title ¬ Problem Statement, ¬ Process Model 2. Requirement Analysis ¬ Creating a Data Flow ¬ Data Dictionary, ¬ Use Cases 3. Project Management ¬ Computing FP ¬ Effort ¬ Schedule, Risk Table, Timeline chart 4. Design Engineering ¬ Architectural Design ¬ Data Design,

Or

DSE-1: Computer Networks Credits 06 DSE1T: Computer Networks Credits 04 Course Contents:

Unit-I: Basic concepts: Components of data communication, standards and organizations, Network Classification, Network Topologies; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite.

Unit-II: 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.

Unit-III: Network Layer: Virtual Circuits and Datagram approach, IP addressing methods – Subnetting; Routing Algorithms (adaptive and non-adaptive)

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.

Network Security: Common Terms, Firewalls, Virtual Private Networks.

DSE1P: Computer Networks Credits 02 Software Lab based on Computer Networks: Implement the concepts of Computer Networks such as: 1. Simulate Checksum Algorithm. 2. Simulate CRC Algorithm 3. Simulate Stop & Wait Protocol. 4. Simulate Go-Back-N Protocol. 5. Simulate Selective Repeat Protocol. and so on….

Or DSE-1: Internet Technologies Credits 06 DSE1T: Internet Technologies Credits 04 Course Contents:

Unit-I: Introduction to Web Design: Introduction to hypertext markup language (html) document type definition, creating web pages, graphical elements, lists, hyperlinks, tables, web forms, inserting images, frames.

Unit-I: Customized Features: Cascading style sheets, (CSS) for text formatting and other manipulations. JavaScript: Data types, operators, functions, control structures, events and event handling. Java: Use of Objects, Array and Array List class, Designing classes, Inheritance, Input/Output, Exception Handling. JDBC: JDBC Fundamentals, Establishing Connectivity and working with connection interface, working with statements, Creating and Executing SQL Statements, Working with Result Set Objects. JSP: Introduction to Java Server Pages, HTTP and Servlet Basics, The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting

Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values. Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

DSE1P: Internet Technologies (lab)

Software Lab based on Internet Technologies

JAVA Script

 1. Create a student registration form. Create functions to perform the following checks: a. Roll number is a 7-digit numeric value b. Name should be an alphabetical value (String) c. Non-empty fields like DOB

2. Implement a static password protection.

3. Write a java script a. To change the colour of text using SetTimeOut() b. To move an image across screen using SetInterval()

JAVA Programs 1. WAP to find the largest of n natural numbers. 2. WAP to find whether a given number is prime or not. 3. WAP to print the sum and product of digits of an Integer and reverse the Integer. 4. 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. 5. Write java program for the following matrix operations: a. Addition of two matrices b. Summation of two matrices c. Transpose of a matrix Input the elements of matrices from user 6. Write a java program that computes the area of a circle, rectangle and a Cylinder using function overloading.