Chhattisgarh Swami Vivekananda Technical University, Bhilai

Name of program: Bachelor of Technology Branch:All Branches | **Semester: III**
Subject: Mathematics – III | **Code: B000311(014)**
Total Theory Periods: 03 | **Total Tutorial Periods: 01**
Class Tests: Two (Minimum) | **Assignments: Two (Minimum)**
ESE Duration: Three Hours | **Maximum Marks: 100** | **Minimum Marks: 35**

Course Objectives:

1. To provide knowledge of Laplace transform of elementary functions including its properties and applications to solve ordinary differential equations.
2. To have thorough knowledge of partial differential equations which arise in mathematical descriptions of situations in engineering.
3. To study about a quantity that may take any of a given range of values that can't be predicted as it is but can be described in terms of their probability.
4. To provide a thorough understanding of interpolation and methods to solve ordinary differential equation.

UNIT-I Laplace transform: Definition, Transform of elementary functions, Properties of Laplace transform, Transform of derivatives & integrals, Multiplication by t^n, Division by t, Evaluation of integrals, Inverse Laplace Transform, Convolution theorem, Unit step function, Unit impulse function, Periodic function, Application to solution of ordinary differential equations.

UNIT- II Partial differential equation: Formation, Solution by direct integration method, Linear equation of first order, Homogeneous linear equation with constant coefficients, Non-homogeneous linear equations, Method of separation of variables.

UNIT- III Random variable: Discrete and continuous probability distributions, Mathematical expectation, Mean and Variance, Moments, Moment generating function, probability distribution, Binomial, Poisson and Normal distributions.

UNIT- IV Interpolation with equal and unequal intervals: Finite differences, Newton's Forward & Backward Difference Formulae, Central Difference Formula, Stirling's Formula, Bessel's Formula, Lagrange's Formula and Newton's Divided Difference Formula.

UNIT-V Numerical Solution of Ordinary Differential Equations: Picard's Method, Taylor's Series Method, Euler's Method, Euler's Modified Method, Runge-Kutta Methods, Predictor-corrector Methods- Milne's Method, Adams-Bashforth Method.

Text Books:

1. "Higher Engg. Mathematics", Dr. B.S. Grewal– Khanna Publishers.
2. "Advanced Engg. Mathematics" , Erwin Kreyszig – John Wiley & Sons.
3. "Numerical Methods in Engineering and Science" , Dr. B.S. Grewal, Khanna Publishers.
4. "Numerical Methods for Scientific and Engineering Computation" , M .K. Jain, S. R. K

Reference Books:

1. "Applied Mathematics", P. N. Wartikar& J. N. Wartikar. Vol-II Pune Vidyarthi Griha Prakashan, Pune.
2. "Applied Mathematics for Engineers & Physicists", Louis A. Pipes- TMH.
3. "Numerical Methods for Scientists and Engineers" K. Shankar Rao, Prentice Hall of India.
4. "Numerical Methods" P. Kandasamy, K. Thilagavathy and K. Gunavathi, S. Chand publication.

Course outcomes: After studying the contents of the syllabus in detail the students will be able to: Define (mathematically) unit step unit impulse, Laplace transform its properties, inverse and applications to solve ordinary differential equations and find Numerical solution of differential equations, which may be arising due to mathematical modelling based on engineering problems. Hands on these Mathematical topics will make them equipped to prepare for higher studies through competitive examinations.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (III)**	Branch: **Computer Science &Engineering**
Subject: **Principles of Programming Languages**	Course Code: **B022313(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 2 T: 1 P: 0 Credits: 3
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

UNIT- I Program Design: Introduction- fundamental design concepts - Modules and modularization criteria – Design notation: Procedure template, Pseudo code - Structured flow chart decision. Tables - Design techniques: Stepwise refinement, Levels of abstraction, Top down- Test Plans-Design guidelines.

UNIT-II Programming language processors: Characteristics of programming languages, Factors influencing the evolution of programming language, Development in programming methodologies, desirable features and design issues, Structure and operations of translators, software simulated computer, syntax, semantics, structure, virtual computers, binding and binding times, storage management comparisons.

UNIT- III Functional & Logic programming languages: Introduction, comparison and applications of functional and logic programming languages; fundamentals of LISP (Objects, Control constructs, List processing) & PROLOG (Syntax, Lists, Operators and arithmetic, Control constructs).

UNIT-IV Object-Oriented Programming Concepts-I: Introduction to Basic Object-Oriented Concepts: (Object, Class, Encapsulation, Abstraction, Data Hiding, Inheritance, Polymorphism, Message Passing), Basic structure of a C++ program, C++ Compiler, C++ Classes, Methods, Objects, Nested Class, Const, Static members, this pointer, Comparison between Pointer and Reference Variables, Comparison between New and Delete Operators.

UNIT-V Object-Oriented Programming Concepts-II: Constructor, Destructor, Function and Operator Overloading, Friend functions and Friend classes, Inheritance, Abstract classes, Polymorphism, Virtual Function and Classes, Dynamic Binding, Exception Handling and Templates.

Text Books:

1. "Software Engineering Concepts" by Richard Fairley, Tata McGraw Hill,
2. "Programming Languages, Design and implementation" by Terrance W. Pratt, and Marvin V. Zelkowitz, Prentice-Hall of India, Fourth edition, 2002.
3. E. Balagurusamy, Object Oriented Programming with C++, Tata McGraw Hill

Reference Books:

1. "Programming Languages – Concepts and Constructs" by Ravi Sethi, Addison-Wesley, 2nd Ed. 1996.
2. "Programming Languages: Principles and Paradigms" by Allen B. Tucker, Robert Noonan, TMH, 2006.

Course Outcomes [After undergoing the course, students will be able to:]

1. Obtain broad understanding of the role of computer science, fundamental software design concepts and notations.
2. Get an overview of various programming language paradigms, processors & software simulation types.
3. Understand key concepts in the implementation of common features of programming languages.
4. Acquire knowledge of basic concepts about object-oriented programming languages.
5. Program in object-oriented programming language paradigm using various computational methods.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (III)**	Branch: **Computer Science &Engineering**
Subject: **Data Structures & Algorithms**	Course Code: **B022312(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

UNIT- I Introduction: Basic Terminology, Elementary Data Organization, Algorithm, Efficiency of an Algorithm, Time and Space Complexity, Asymptotic notations: Big-Oh, Time-Space trade-off. Abstract Data Types (ADT) Arrays: Definition, Single and Multidimensional Arrays, Row Major & Column Major Order Representation of Arrays, Application of arrays, Sparse Matrices and their representations. Linked lists: Array Implementation and Dynamic Implementation of Singly Linked Lists, Doubly Linked List, Circularly Linked List, Operations on a Linked List. Insertion, Deletion, Traversal, Polynomial Representation and Addition, Generalized Linked List.

UNIT-II Stacks: Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack in C, Application of stack: Prefix and Postfix Expressions, Evaluation of postfix expression, Recursion, Tower of Hanoi Problem, Simulating Recursion, Principles of recursion, Tail recursion, Removal of recursion Queues, Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Array and linked implementation of queues in C, Dequeue and Priority Queue.

UNIT- III Trees: Basic terminology, Binary Trees, Binary Tree Representation: Array Representation and Dynamic Representation, Complete Binary Tree, Algebraic Expressions, Extended Binary Trees, Array and Linked Representation of Binary trees, Search Trees: Binary Search Trees (BST), Insertion and Deletion in BST Trees, Traversal algorithms: Inorder, Preorder and Postorder, Threaded Binary trees, Traversing Threaded Binary trees.

UNIT-IV Graphs: Terminology, Sequential and linked Representations of Graphs: Adjacency Matrices, Adjacency List, Adjacency Multi list, Graph Traversal: Depth First Search and Breadth First Search, Connected Component, Spanning Trees, Minimum Cost Spanning Trees: Prims and Kruskal algorithm. Transistive Closure and Shortest Path algorithm: Warshal Algorithm and Dijikstra Algorithm.

UNIT-V Searching: Sequential search, Binary Search, Comparison and Analysis Internal Sorting: Insertion Sort, Selection, Bubble Sort, Quick Sort, Two Way Merge Sort, Heap Sort, Radix Sort, Tree (BST) Sort; Complexity of Search Algorithm, AVL trees, Introduction to m-way Search Trees, B Trees & B+ Trees, Hashing: Hash Function, Collision Resolution Strategies, Storage Management: Garbage Collection and Compaction.

Text books:

1. Aaron M. Tenenbaum, YedidyahLangsam and Moshe J. Augenstein “Data Structures Using C and C/C++” , PHI
2. Horowitz and Sahani, “Fundamentals of Data Structures”, Galgotia Publication.
3. Lipschutz, “Data Structures” Schaum’s Outline Series, TMH

References books:

1. Jean Paul Trembley and Paul G. Sorenson, “An Introduction to Data Structures with applications”, McGraw Hill
2. R. Kruse etal, “Data Structures and Program Design in C”, Pearson Education
3. G A V Pai, “Data Structures and Algorithms”, TMH

Course Outcomes [After undergoing the course, students will be able to:]

1. Have a comprehensive knowledge of the data structures and algorithms on which file structures and data bases are based.
2. Understand the importance of data and be able to identify the data requirements for an application.
3. Have in depth understanding and practical experience of algorithmic design and implementation.
4. Have practical experience of developing applications that utilize databases.
5. Understand the issues involved in algorithm complexity and performance.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (III)**	Branch: **Computer Science &Engineering**
Subject: **Digital Electronics**	Course Code: B022314(022)
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

UNIT- I Digital Fundamentals: Weighted & Non-weighted codes, Sequential codes, self-complementing codes, Cyclic codes, 8-4-2-1 BCD code, Excess-3 code, Gray code: Binary to Gray and Gray to binary code conversion, Error detecting code, Error correcting code, 7-bit Hamming code, ASCII code, Binary Arithmetic, Boolean Algebra, Minimization of Switching Function , Demorgan's Theorem, Karnaugh's Map Method, Quine-McCluskey's Method (Tabular Method). Basic and Universal logic Gates, Realization of switching functions using gates.

UNIT-II Digital Logic Families and Memory: Transistor Inverter: Basic Concepts of RTL and DTL; TTL: Open collector gates, TTL subfamilies, IIL, ECL; MOS Logic: CMOS Logic, Dynamic MOS Logic, Interfacing: TTL to ECL, ECL to TTL, TTL to CMOS, CMOS to TTL, and Comparison among various logic families. Memories: ROM and RAM, PLA, PAL and FPGA;

UNIT- III Combinational Circuits: Adder & Subtractor: Half adder, Full adder, Half-subtractor, Full-subtractor, Parallel Binary adder, Look Ahead carry adder, Serial adder, BCD adder. Code converter, Parity bit generator/Checker, Comparator. Decoder: 3-line to 8-line decoder, 8-4-2-1 BCD to Decimal decoder, BCD to Seven segment decoder. Encoder: Octal to binary and Decimal to BCD encoder. Multiplexer: 2-input multiplexer, 4-input multiplexer. De- multiplexer: 1-line to 4-line, study of Multiplexer as Universal Logic Function Generator.

UNIT-IV Sequential Circuits: Flip-Flops: SR, JK, T, D, Master/Slave JK FF and their conversion, Excitation Tables. Introduction to registers (SISO, SIPO, PIPO, PISO) and Design of Counters- Ripple Counters, Ring Counters, Shift registers, Universal Shift Register.

UNIT-V Machines and Application: Finite State Machine, Meelay Machine, Moore Machine, **Introduction to VHDL:** Behavioral – data flow and algorithmic and structural description, lexical elements, data objects types, attributes, operators; VHDL coding examples.

Text Books:

1. R. P. Jain: "Modern Digital electronics", TMH.
2. B. Somanathan Nair, "Digital Electronics & Logic Design", Prentice-Hall of India.
3. Pedroni V.A., "Digital Circuit Design with VHDL", Prentice Hall, India 2nd Edition.

Reference Books:

1. R J Tocci, "Digital System principles and Applications"
2. "Digital Electronics " by A.K.Maini, Wiley India.
3. M.M. Mano: "Digital logic and computer design", PHI.
4. Floyd: "Digital fundamentals", UBS.

Course Outcomes [After undergoing the course, students will be able to:]

1. Apply digital coding concepts to simplify circuit design.

2. Analyze the operations of various logic families and different semiconductor memories.
3. Design and implement various combinational circuits
4. Outline the concepts of latch circuits, flip flops and counters.
5. Design and develop basic digital systems using VHDL.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (III)**	Branch: **Computer Science &Engineering**
Subject: **Operating System**	Course Code: B022315(022)
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

UNIT- I Introduction: Operation System objectives and functions, The Evolution of operating Systems, Batch Systems, interactive systems, time sharing and real time systems, Protection. Operating System Structure, System Components, operating system service, System structure. Distributed Computing.

UNIT-II Concurrent Processes: Process concept: Introduction, Definitions, Process States, Process State Transitions, The process Control Block, Operations on Processes, Suspend and Resume, Interrupt Processing. Mutual Exclusion, the Producer / Consumer problem, the critical section problem, Semaphores, Classical problems in concurrency, inter process communication. CPU scheduling: concepts, performance criteria, and scheduling Algorithms. Algorithm evaluation, Multiprocessor scheduling.

UNIT- III Dead Locks: System model, Deadlock characterization. Prevention, Avoidance and Detection, Recovery from deadlock, combined approach.

UNIT-IV Memory Management: Base machine, Resident Monitor, multiprogramming with fixed partition, Multiprogramming with variable partitions, Paging, Segmentation, paged - segmentation, virtual Memory concepts, Demand paging, performance, Page Replacement algorithms, Allocation of frames, Thrashing, cache memory organization.

UNIT-V I/O Management & Disk Scheduling: I/O system Interrupts Direct Memory Access, I/O Buffering, File system: File Concepts – File organization and Access mechanism, File Directories, File sharing, Implementation issues. Disk Scheduling algorithms. Case Study on LINUX: Kernel and Buffer Cache Architecture, concept of inode file & directory structure, Basic system calls (Open, Read, Write, namei, File and Record Close, File Creation, Creation of Special Files, Change Directory and Change Root, Change Owner and Change Mode

Text Books:

1. Operating system concepts Galvin by Silberschatz, John Wiley & Sons
2. Operating System Design & Implementation by Tanenbaum, A.S., PHI.
3. The Design of Unix Operating System, Maurice J. Bach, Pearson Education.

Reference Books :

1. Modern Operating System: Andrew S. Tanenbaum, PEARSON EDUCATION INTERNATIONAL
2. Operating System concepts by Silberscatz A and Peterson, J.L, PE- LPE.
3. Operating systems: Internals & Design Principles, William Stallings, PHI.

Course Outcomes [After undergoing the course, students will be able to:]

1. Identify the role of operating system in making computers execute data-processing jobs.
2. Realize managing computer's resource complexity during concurrent process execution through OS layers.
3. Analyse the reasons of resource bottlenecks-concurrency, deadlock and various synchronization mechanisms available.
4. Understand the functioning of operating system components in Memory Management techniques, Virtual Memory Management.
5. Understand disk organization, file system structure, Secondary Storage Management functions of OS.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (III)**	Branch: **Computer Science &Engineering**
Subject: **Data Structures (Laboratory)**	Course Code: **B022321(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: (At least 10 experiments are to be performed by each student)

1. Write a program to perform following operations in one dimensional array, Insertion, Deletion and Searching (Linear & Binary).
2. Write a program to implement stack and perform push and pop operations.
3. Write a program to convert infix to postfix expressions using stack.
4. Write a program to perform following operations on a linear queue - addition, deletion, traversing.
5. Write a program to perform following operations on a circular queue - addition, deletion, traversing. 6. Write a program to perform following operations on a double ended queue - addition, deletion, traversing.
6. Write a program to perform following operations on a single link list-creation, insertion, deletion.
7. Write a program to perform following operations on a double link list – creation, insertion, deletion. 9. Write a program to implement polynomial in link list and perform. a) Polynomial arithmetic b) Evaluation of polynomial
8. Write a program to implement a linked stack and linked queue.
9. Write programs to perform Insertion, selection and bubble sort.
10. Write a program to perform quick sort.
11. Write a program to perform merge sort.
12. Write a program to perform heap sort.
13. Write a program to create a Binary search tree and perform –insertion, deletion & traversal.
14. Write a program to traversal of graph (Breadth-first Search, Depth-first Search methods)

Remarks: The students are free to choose any programming platform from (C++ / JAVA / PYTHON) to perform the above-mentioned set of laboratory experiments.

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Understand the importance of abstract data types, structure types and their usability in different applications through different programming platforms.
2. Implement various data structure operations (traversal, accession, insertion, deletion & updation) on stacks, linked lists, queues, trees & graphs.
3. Design and analyse the time and space efficiency of implemented data structures
4. Identity the selection of appropriate data structure for given problem situations.
5. Implement various kinds of searching and sorting techniques.

Recommended Books:

1. Aaron M. Tenenbaum, YedidyahLangsam and Moshe J. Augenstein “Data Structures Using C and C/C++”, PHI
2. Jean Paul Trembley and Paul G. Sorenson, “An Introduction to Data Structures with applications”, McGraw Hill.
3. Lipschutz, “Data Structures” Schaum’s Outline Series, TMH

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (III)**	Branch: **Computer Science &Engineering**
Subject: **Digital Electronics Laboratory**	Course Code: **B022322(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: (At least 10 experiments are to be performed by each student)

1. To study the characteristics and operations of TTL Inverters, OR, AND, NOR and NAND gate using ICs.
2. To study NAND and NOR gates as a universal logic.
3. To study and prove Demorgan's Theorem .
4. To design Half and Full adder circuits using logic gates.
5. To design Half and full subtractor circuits using logic gates.
6. To study the binary parallel adder.
7. To design 4 bit magnitude comparator circuits.
8. To study the 7 segment decoder .
9. To design 4:16 decoder using two 3:8 decoder and four 2:4 decoder
10. To design 16: 1 Multiplexer using 4:1 Multiplexer.
11. To study various types of flip flops using logic gates and ICs.
12. To design Mode-N and divide by K counter.
13. To construct a 4 bit binary to gray converter and vice versa using IC 7486 .
14. To study Up-Down counter.
15. To study programmable shift registers.

Experiments using VHDL (At least 4 Experiments are to be performed by each student)

1. Design AND,OR,XOR gates.
2. Design Half Adder (Data Flow Style)
3. Design Half Adder (Behavioural Style)
4. Design Half Adder (Structural style Direct entity instantiation)
5. Design Half Adder (Structural style indirect entity instantiation(Component))
6. Design Half Adder (Mixed Style)
7. Design 4 bit comparator Using std_logic_vector inputs.
8. Design 4:1 Multiplexer using Boolean expression
9. Design the 7 segment decoder .
10. Design 3:8 decoder

Laboratory Equipment / Machine Requirements: Logic gate trainer, Digital ICs Trainer, Various ICs 7400,7402,7404,7408,7432,7486,74138,74151,74155 etc, Xilinx ISE WebPACK

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Acknowledge about the fundamentals of digital circuit Design.
2. Understand the concepts of logic families.
3. Take interest to design and develop ICs in VLSI industries.
4. Understand the operations of latch circuits, flip flops, counters & semiconductor memories.
5. Understand and design combinational circuits.

Recommended Books:

1. M.M. Mano : "Digital Logic and Computer Design";
2. Kenneth L. SHORT "VHDL FOR ENGINEERS", Pearson Education.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (III)**	Branch: **Computer Science &Engineering**
Subject: **Operating Systems (UNIX) Laboratory**	Course Code: B022323(022)
T**otal / Minimum-Pass Marks** (End Semester Exam): **40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: (At least 10 experiments are to be performed by each student)

1. Practice session: Study the features of Linux environment, basic Linux commands (echo, who, date, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, find, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, comm, cmp, diff, tr); also document the syntax and semantics of those commands.
2. Write a shell script that accepts a name from the user and displays whether it is a file, directory or something else.
3. Write a shell script that creates users; also check if a particular user has logged in or not. If not, continue the loop till he/she logins. Once the required user logins, display a message.
4. Write a shell script that searches for a given string in a text input file.
5. Write a shell script that compiles all C files in your home directory and creates executable files.
6. Write a shell script that given a filename as argument, deletes all even lines in a file & removes duplicate lines from a file.
7. Write a shell script that enhances find command by adding error messages that explain why the command failed.
8. Write a shell script to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer. Calculate percentage and grade according to following logic:
   Percentage >= 90% : Grade A, Percentage >= 80% : Grade B, Percentage >= 70% : Grade C, Percentage >= 60% : Grade D, Percentage >= 40% : Grade E, Percentage < 40% : Grade F.
9. Write a shell script to accept the name, grade, and basic salary from the user. Write the details into a file called employee, separating the fields with a colon (,) continue the process till the user wants.
10. Write an Áwk' script to count the number of lines in a file that do not contain vowels.
11. Write an Áwk' script to find the number of characters, words and lines in a file.
12. Write a C program to simulate following non-preemptive CPU scheduling algorithms: a) FCFS b) SJF c) Round Robin (pre-emptive) d) Priority scheduling techniques.
    a. to find average turnaround times and waiting times;
    b. to display / print Gantt Chart (in any convenient format).
13. Implement the Producer – Consumer problem using semaphores (using UNIX system calls).
14. Write a C program to simulate disk-scheduling algorithms: a) FCFS b) SCAN c) C-SCAN techniques.
15. Write a C program to simulate page replacement algorithms: a) FIFO b) LRU c) LFU d) OPT techniques.

Remarks: The laboratory experiments may be performed in with of the LINUX shell environments: BOURNE Shell / KORN Shell / 'Ç' Shell.

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Understand the concept of Unix and shell programming.
2. Learn the working of Linux OS Kernel.
3. Analyse the differences between features provided in Windows and Linux operating system.
4. Learn the concept of loops and decision-making statements.
5. Analyse the logic & procedure of problem solving through Scripts.

Recommended Books:

1. Advance UNIX, a Programmer's Guide, S. Prata, BPB Publications, New Delhi.
2. The Complete Reference Unix, Rosen, Host, Klee, Farber, Rosinski, Second Edition, TMH.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (III)**	Branch: **Computer Science &Engineering**
Subject: **Software Laboratory (SciLAB / MATLAB)**	Course Code: **B022324(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: (At least 10 experiments are to be performed by each student)

1. Identification of different matrix types.
2. Properties and Operations of arrays and matrices.
3. Write a program to find probability of tossing a coin and rolling a die through large no. of experimentation.
4. Compute y- coordinates of a STRAIGHT LINE y = mx + c, where slope of line m =0.5 , intercept c= -2 and x-coordinates : x = 0 to 10 for 0.5 increments.
5. Plot y = Sin x where $0 \leq x \leq 2$.
6. Plot y = e - 0.4 x Sin x where $0 \leq x \leq 4$.
7. Find the solution of linear algebraic equations in 2 variables, 3 variables:
   a. x + 4y = 18; 2x +3y =16
   b. x + 2 y + 3 z = 1; 3x + 3 y + 4 z = 1; 2x + 3 y + 3 z = 2
8. Determination of roots of a given polynomial & quadratic equations.
9. Determination of Eigen Value & Eigen Vectors for matrices.
10. Write a script file to draw a unit circle.
11. Write a function factorial to compute the factorial n! for any integer n.
12. Write a function factorial to compute the factorial n! using RECURSION for any integer n.
13. Write a function to compute the geometric series
    1 + r + r2 + r3 + ……+ rn for given r and n.
14. Write a function file *crossprod* to compute the cross product of two vectors u and v.
15. Design of a toy project as an independent study towards problem-based learning.

Laboratory Equipment: The experiments may be performed in FOSS (Spoken Tutorials SciLAB Project: www.scilab.org, www.scilab.in.

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Understand the main features of the MATLAB/SCILAB program development environment to enable their usage in the higher learning.
2. Realize the power of interactive calculation, programming, graphics, animation in SciLAB / MATLAB and complete portability across platforms.
3. Enjoy SciLAB / MATLAB as a scientific computing and visualization tool.
4. Explore Interactive Computation with matrices and arrays of n-dimensions.
5. Interpret and visualize simple mathematical functions and operations there on using plots/display.

Recommended Books:

1. Getting started with MATLAB: A Quick Introduction for Scientists and Engineers by Rudra Pratap, IIS Banaglore.
2. Scilab Manual for Probability Theory and Statistics Lab by Prof S N Chandra Shekhar; https://scilab.in/lab_migration_run/82
3. Scilab Manual for Numerical techniques lab by Prof Kanika Gupta; https://scilab.in/lab_migration_run/82
4. Scilab Manual for Probability Theory and Random Processes by Prof Shital Thakkar; https://scilab.in/lab_migration_run/82.
5. Scilab Manual for Numerical Techniques by Dr Javed Dhillon; https://scilab.in/lab_migration_run/82

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (III)**	Branch: **Computer Science &Engineering**
Subject: Soft Skills & Personality Development	Course Code: B000306(046)
Total Marks (Internal Assessment): 10	L: 0 T:0 P: 2 Credit(s): 0
Internal Assessments to be conducted: 02	Duration (End Semester Exam): **NA**

UNIT-1 Communication Skills-Basics: Understanding the communicative environment, Listening: What to listen for and why, When to speak and how, Starting and sustaining a conversation, Presentation and Interaction, Common errors during communication, Humour in Communication.

UNIT-2 Interpersonal communication: Building Relationships, Understanding Group Dynamics- I, Emotional and Social Skills, Groups, Conflicts and their Resolution, Social Network, Media and Extending Our Identities

UNIT- 3 Vocational skills: Managing time: Planning and Goalsetting, managing stress: Types of Stress; Making best out of Stress, Resilience, Work-life balance, Applying soft-skills to workplace

UNIT-4 Mindsets and Handling People: Definitions and types of Mindset**,** Learning Mindset**,** Developing Growth Mindset**,** Types of People**,** How to say NO

UNIT-5 Inner Development: Motivating oneself, Persuasion, Survival Strategies, Negotiation, Leadership and motivating others**,** controlling anger**,** Gaining Power from Positive Thinking.

Text Books:

1. Petes S. J., Francis. Soft Skills and Professional Communication. New Delhi: Tata McGraw-Hill Education, 2011.
2. Stein, Steven J. & Howard E. Book. The EQ Edge: Emotional Intelligence and Your Success. Canada: Wiley & Sons, 2006.
3. Dorch, Patricia. What Are Soft Skills? New York: Execu Dress Publisher, 2013.

Reference Books:

- Kamin, Maxine. Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders. Washington, DC: Pfeiffer & Company, 2013.
- Canfield, Jack.The Success Principles (TM) — 10th Anniversary Edition: How to get from Where You Are to Where You want to Be. New York Times. 2009.
- Peale Norman Vincent. The Power of Positive Thinking: 10 Traits for Maximum Result. Paperback Publication. 2011.
- Klaus, Peggy, Jane Rohman & Molly Hamaker. The Hard Truth about Soft Skills. London: Harper Collins E-books, 2007.

Course Outcomes [After undergoing the course, students will be able to:]

1. Learn to listen actively to analyse audience and tailor the delivery accordingly.
2. Increase their awareness of communication behaviour by using propriety profiling tool.
3. Master three “As” of stressful situation: Avoid, Alter, Accept; to cope with stressors and create a plan to reduce or eliminate them.
4. Develop growth mindset and able to handle difficult person and situations successfully.
5. Develop technique of turning negativity into positivity and generate self-motivation skills.