(An Autonomous College under VTU)

Department of Computer Applications

I Semester Scheme of Teaching and Examinations with Syllabus

Bachelor of Computer Applications (BCA)

Effective from the Academic Year (2025-26)

NAGARJUNA COLLEGE OF ENGINEERING & TECHNOLOGY, BENGALURU
Bachelor of Computer & Applications Scheme of Teaching and Examinations-2025
Outcome Based Education (OBE) and Choice Based Credit System (CBCS) (Effective from the academic year 2025-26)

I SEMESTER

Sl. No	Course	Course Code	Course Title	Teaching Hours per Week			Examination				Credits
				Theory	SDA/Tutorial	Practical	Duration (Hrs)	IAT Marks	SEE Marks	Total Marks	
				L	SDA/T	P					
1	AEC	25BCT101A	Balike Kannada (MCQ)	02	-	--	02	50	50	100	2
		25BCT101B	Samskrutika Kannada (MCQ)								
2	AEC	25BCT102	Professional Communication Skills	02	-	--	02	50	50	100	2
3	PCC	25BCT103	Problem Solving using C Programming(K/E)	03	--	--	03	50	50	100	3
4	PCC	25BCT104	Computer Essentials (K/E)	03	--	--	03	50	50	100	3
5	PCC	25BCT105A	Fundamentals of Mathematics(A) (K/E)	03	--	--	03	50	50	100	3
		25BCT105B	Fundamentals of Accountancy(B) (K/E)								
6	AEC	25BCT106	Indian Knowledge System (K/E)(MCQ)	02	-	--	02	50	50	100	2
7	PCCL	25BCL107	Programming in C Lab	01	-	02	03	50	50	100	2
8	PCCL	25BCL108	Essentials of Computer Lab	01		02	03	50	50	100	2
9	VAC	25BCT109	Environmental studies (K/E) (MCQ)	00	02	-	02	50	50	100	1
TOTAL				**17**	**02**	**04**	**27**	**450**	**450**	**900**	**20**

AEC-Ability Enhancement Courses, **PCC** – Professional Core Courses, **PCCL** – Professional Core Course Laboratory, **VAC** – Value Added Courses. 25**BCT**105A- Fundamentals of Mathematics- This is for students other than those in the science stream at 10+2 level. BCA105B- for Science Stream students. **SDA**- Skill Development Activities.

25BCT101A- Balike Kannada(for non-Karnataka students) 25BCT101B- Samskrutika Kannada- (For Karnataka Students)

At the beginning of the semester 21 days of the Induction Program. 11 days in the beginning of the 1st semester and 10 days in the beginning of the 2nd semester

SEMESTER-I

PROFESSIONAL COMMUNICATION SKILLS		SEMESTER	I
Course Code	**25BCT102**	CIE Marks	50
Teaching Hours/Week (L: T/SDA:P)	2:0:0	SEE Marks	50
Total Hours of Pedagogy	25-30	Total Marks	100
Credits	02	Exam Hours	03
Type of the course	Theory		

COURSE OBJECTIVES:

- To enable the students to understand the skills required for effective communication at different levels of an organization.
- To enhance listening, note and presentation skills.
- To build communication skills among the students required for Digital Platforms.
- To build Business Correspondence Skills among the students.

MODULE-1

FUNDAMENTALS OF COMMUNICATION SKILLS: Introduction - Meaning of Communication; Objectives of Communication; Process of Communication; Principles of Communication; Effective Communication vs perfect Communication; Barriers to Effective Communication; Types of Communication (Meaning & Features) Interpersonal, Intrapersonal, Upward, Downward, Internal, External, Lateral, One-way, Two-way. (Communication in an organization) Cross Cultural Communication; Meaning; Scope of cross-cultural communication skills; Limitations of Communication skills in business. Verbal and Non-Verbal, Formal & Informal communication Skills.

6 Hours

MODULE-2

COMMUNICATION SKILLS:

Listening skills: Meaning; Importance of Listening; Types of listening (Meaning& Benefits of types of Listening) –Comprehension, Critical, Attentive, Reflective, Discriminative, Biased, Evaluative; Listening Process; Barriers to listening skills; Overcoming from barriers to listening. Reading skills – Meaning; Importance of Reading Skills; Reading comprehension skills –Inferential, Literal, Evaluative, Types of Reading Techniques: Skimming, Scanning, Intensive, Extensive and Guidelines for improving good Reading Skills. Note-taking skills: Meaning; Importance of note taking; Methods of note making. Presentation skill: Presentation skills & its importance in Business Communication; Types.

6 Hours

MODULE-3

COMMUNICATION MEDIA AND PLATFORMS:

Communication Media/Channel: Meaning Importance of Communication Channels; Types of

Communication Medium / channels: (a) Physical Media – Meaning & its Types. (b) Mechanical Media – Meaning & its Types. (c) Push and Pull Channels – Meaning and its Features.

Communication Platform: Internal & External Platforms – Meaning and importance Internal

communication Platforms – Intranet, Blogosphere, Portals, You tube, Google Hangouts, Skype,

Webcasts and zoom. External Communication Platforms: Corporate Website, Face book, Twitter, LinkedIn, You tube Accounts, Corporate Blog. (Each of the types only Meaning and Importance to be discussed) Technology in Business Communication: Introduction, Advantages & disadvantages of technology in communication.

6 Hours

MODULE-4

COMMUNICATION SKILLS & ETHICS: Introduction - Meaning; Importance of ethical communication; Ethical Communication & Business. Ethical perspectives – Utilitarian, Universalistic, Religious, Economic, Legal, Humanistic, Dialogic, Situational perspectives in relation to business. Ethical issues in business communication – Respect, Honesty, Sensitivity to Cultural Differences. Ethical dilemmas involved in business communication – Whistle blowing, Rumors & Gossip, Secrecy, Ambiguity, Lying.

6 Hours

MODULE-5

BUSINESS CORRESPONDENCE: Writing Skills - Art of Condensation (Precis writing), Essay writing – Types of essays, features of an essay, Paragraph writing – structure of paragraph writing. Business Letters – Meaning; Importance and Advantages of Business Letters; Letter components and Layout. Different Types of Business Letters. (a) Letters of Inquiries (b) Replies to Inquiries (c) Orders (d) Complaints & Adjustment Letters (e) Collection Letters & etc.

6 Hours

Teaching Methodology: Chalk and talk method / PowerPoint Presentation.

COURSE OUTCOMES:

After the completion of the Course, students will be able to

CO 1. Explain the skills required for effective communication at different levels of an organization.

CO 2. Analyze themselves with good listening, note taking and presentation skills.

CO 3. Develop good communication skills among the students required for Digital Platforms.

CO 4. Demonstrate **e**fficiently Manage with Business Correspondence Skills among the students.

CO 5. Compose clear, concise and well structured documents like emails, reports, etc.

Suggested Learning Resources:

Books:

1. Communication Skills, Fillip Learning - FL.
2. Taylor, Shirley, Communication for Business: A Practical Approach, Pearson Education
3. C.S. Raydu, Corporate Communication, HPH

References:

1. Rai & Rai, Business Communication, HPH
2. S.P. Sharman, Bhavani.H, Corporate Communication, VBH
3. K. Venkataramana, Corporate Communication, SHBP
4. Rajkumar, Basic Business Communication: Concepts, Applications and Skills, Excel Books
5. Peter URS Bender, Robert. A.Traez, Secrets of Face to Face Communication, Macmillan India

PROBLEM-SOLVING USING C PROGRAMMING		SEMESTER	I
Course Code	**25BCT103**	CIE Marks	50
Teaching Hours/Week (L: T/ SDA: P)	3:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Type of the course	Theory		

COURSE OBJECTIVES:

- To develop skills in solving problem.
- To obtain knowledge about the structure of the programming language C.
- To develop the program writing and logical thinking skill.

MODULE-1

Problem Solving techniques: Introduction, Problem solving procedure, **Algorithm:** Steps involved in algorithm development. **Algorithms for simple problems:** To find largest of three numbers, factorial of number, check for prime number, check for palindrome, Count no. of odd, even and zeros in list of integers.

Flowcharts: Definition, advantages, Symbols used in flow charts. Flowcharts for simple problems mentioned in algorithms. Pseudocode.

8 Hours

MODULE-2

Introduction to C: Overview of C Program, Importance of C Program, Basic structure of a C-program, Execution of C Program**.**

Constants, Variables & Data types: Character set, C token, Keywords & identifiers, Constants, Variables, datatypes, Declaration of variables, assigning values to variables, defining symbolic constants.

Operators and Expression: Arithmetic, Relational, logical, assignment, increment & decrement, conditional, bit wise & special operators, evaluation of expressions, Precedence of arithmetic operators, type conversions in expressions, operator precedence & Associativity, built in mathematical functions.

8 Hours

MODULE-3

Managing Input and Output operations: Reading & writing a character, formatted input and output.

Decision Making and Branching: Decision making with if statement, simple if statement, the if else statement, nesting of if … else statements, the else if ladder, the switch statement, the ?: operator, the goto statement.

Decision making and looping: The while statement, the do statement, for statement, exit, break, jumps in loops.

8 Hours

MODULE-4

Arrays: Declaration, initialization & access of one dimensional & two-dimensional arrays. Programs using one- and two-dimensional arrays- sorting and searching arrays.

Handling of Strings: Declaring &initializing string variables, reading strings from terminal, writing strings to screen, Arithmetic operations on characters, String Handling functions, table of strings. **User defined functions:** Need for user defined functions, Declaring, defining and calling C functions return values & their types, **Categories of functions:** With/without arguments, with/without return values. Nesting of functions

8 Hours

MODULE-5

Structures, union and Pointers: Structure definition, giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, Structure and functions, structures within structures. **Unions. Pointers:** Understanding pointers, accessing the address of a variable, declaring & initializing pointers, accessing a variable through its pointer, pointer expression, pointer increments & scale factor, passing pointer variables as function arguments.

8 Hours

Teaching Methodology: Chalk and talk method / PowerPoint Presentation.

COURSE OUTCOMES:

After the completion of the Course, students will be able to

CO 1. Describe the C Programming language which includes the structure of a C program, Tokens, Expressions, Operators etc.

CO 2. **Develop** C programs using conditional and iterative statements to write C programs.

CO 3. Construct the C programs that uses pointers to access arrays and strings.

CO 4. Implement the user defined functions to solve real time problems.

CO 5. Apply file handling techniques to perform input output operations in C.

Suggested Learning Resources:

Books

1. Computer Fundamentals and Programming in C – Reema Thareja, 2nd Edition, Oxford University, 2017.
2. E. Balaguruswamy, Programming in ANSI C, 7th Edition, Tata McGraw-Hill

References

1. Brian W. Kernighan and Dennis M. Ritchie, the 'C' Programming Language, Prentice Hall of India Yashavanth Kanetkar, Let us C, Authentic Guide to C Programming Langauge, bpb publisher, 17th Edition, 2020
2. Yashavanth Kanetkar, Let us C, Authentic Guide to C Programming Langauge, bpb publisher, 17th Edition, 2020

COMPUTER ESSENTIALS		SEMESTER	I
Course Code	**25BCT104**	**CIE Marks**	50
Teaching Hours/Week (L: T/SDA:P)	3:0:0	**SEE Marks**	50
Total Hours of Pedagogy	40-45	**Total Marks**	100
Credits	03	**Exam Hours**	03
Type of the Course/Subject	Theory		

COURSE OBJECTIVES:

- To provide foundational knowledge of computer systems, including their history, architecture, and essential operations.
- To equip students with practical skills in operating systems, networking, office applications, and file system management.

MODULE-1

Introduction to computers: History of Computing, **Data Storage:** Bits and Their Storage, Main Memory, Mass Storage, Representing Information as Bit Patterns, The Binary System. **Data Manipulation:** Computer Architecture, Machine Language, Program Execution Arithmetic/Logic Instructions.

8 Hours

MODULE-2

Operating System Fundamentals: The History of Operating Systems, Operating System Architecture, Types of Operating System, Coordinating the Machine's Activities, Handling Competition Among Processes, Security.

8 Hours

MODULE-3

Data Communications & Computer Networks: Components, Data Representation, Data Flow, Network Criteria, Physical Structures**,** network types, internet history.

8 Hours

MODULE-4

Office Tools: Using office tools, Creating, Saving, Closing, and Opening Office Files, Working with Files, Using the Ribbon, Tabs, and Quick Access Toolbar, Using Context Menus, the Mini Toolbar, and Keyboard Shortcuts, Organizing and Customizing Folders and Files.

Usage of office tools

8 Hours

MODULE-5

File-System Interface: File Concept, Access Methods, Directory and Disk Structure, File- System Mounting, File Sharing, Protection, File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance, Recovery.

8 Hours

Teaching Methodology: Chalk and talk method / PowerPoint Presentation

COURSE OUTCOMES:

After the completion of the Course, students will be able to

CO 1. Perceive the basic computer concepts including history, data storage, and data manipulation techniques.

CO 2. Learn the fundamentals of operating systems and their role in managing computer resources and security.

CO 3. Gain knowledge of data communication principles and computer networking basics.

CO 4. Develop proficiency in using office tools for document creation, data management, and presentation.

CO 5. Explore the structure and management of file systems including file operations, directory structures, and storage management.

Suggested Learning Resources:

Books

1. J. Glenn Brookshear," Computer Science: An Overview", Addision-Wesley, Twelfth Edition, 2014

References

1. Silberschatz A, Gagne G, Galvin PB. Operating system concepts. Ninth Edition, Wiley; 2012.
2. Cobbaut P. Linux Fundamentals. Samurai Media Limited; 2016.
3. Silberschatz A, Korth HF, Sudarshan S. Database system concepts. Sixth Edition, McGraw Hill; 2010.
4. Microsoft Office 365: In Practice, 2019 Edition, 1st Edition ISBN10: 1260079902 | ISBN13: 9781260079906, By Randy Nordell, Kathleen Stewart, Annette Easton and Pat Graves © 2020

FUNDAMENTALS OF MATHEMATICS		SEMESTER	I
Course Code	**25BCT105A**	CIE Marks	50
Teaching Hours/Week (L: P: SDA)	3:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Type of the Course /Subject	Theory		

COURSE OBJECTIVES:

- The Curriculum supports the prerequisites to enhance their Mathematical knowledge towards understanding mathematical Concepts in the concerned fields.
- Enhance problem-solving skills using mathematical models and algorithms.
- Develop logical reasoning and analytical thinking.
- Understand the mathematical foundations of computer science, including discrete mathematics and graph theory.
- Apply mathematical concepts to computer science problems, such as algorithm design and analysis.

MODULE-1

Introduction to Number System: Overview of number systems: Binary numbers, Number based conversion, Octal and hexadecimal numbers, Complements.

8 Hours

MODULE-2

Propositional Logics: Mathematical logic introduction-statements Connectives-negation, conjunction, disjunction- statement formulas and truth tables- conditional and bi Conditional statements- tautology contradiction.

8 Hours

MODULE-3

Set Theory: Operations on sets, power set, Venn diagram, Cartesian product, relations, functions- types of functions - composition of functions.

8 Hours

MODULE-4

Matrix algebra: Introduction, Types of matrices-matrix operations, transpose of a matrix, determinant of matrix, inverse of a matrix, Cramer's rule. **8 hours**

MODULE-5

Differential calculus: Functions and limits - Simple Differentiation of Algebraic Functions – Evaluation of First and Second Order Derivatives – Maxima and Minima .

8 Hours

Teaching Methodology: Chalk and talk method / PowerPoint Presentation

COURSE OUTCOMES:

After the completion of the Course, students will be able to

CO1. Solve and convert between binary, octal, and hexadecimal number systems.

CO2. Apply propositional logic to create and interpret truth tables.

CO3. Perform operations on sets and analyze functions using Venn diagrams.

CO4. Conduct matrix operations and solve linear equations using matrices.

CO5. Differentiate algebraic functions and apply calculus to find maxima and minima.

Suggested Learning Resources:

Books

1. Digital Logic and Computer Design, M. MORRIS MANO Professor of Engineering California State University, Los Angeles.
2. Discrete mathematics and its applications / Kenneth H. Rosen, Monmouth University (and formerly AT&T Laboratories).

FUNDAMENTALS OF ACCOUNTANCY		SEMESTER	I
Course Code	**25BCT105B**	CIE Marks	50
Teaching Hours/Week (L: P: SDA)	3:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03

COURSE OBJECTIVES:

- Understand Core Accounting Concepts: Equip students with foundational knowledge of accounting principles, processes, and standards, enabling them to accurately record and report financial transactions.
- Apply Practical Accounting Skills: Develop students' ability to manage various accounting tasks, such as journalizing, ledger posting, and bank reconciliation, ensuring they can effectively handle real-world financial data.

MODULE-1

MEANING AND SCOPE OF ACCOUNTING: History and Development of Accounting, Meaning, Objectives and functions of Accounting, Book keeping V/s Accounting, Users of accounting data, systems of book keeping and accounting, branches of accounting, advantages and limitations of accounting . 8 Hours

MODULE-2

ACCOUNTING PRINCIPLES: Meaning of accounting principles, accounting concepts, account conventions, accounting principles and the institute of charted accounts of India, Statements of accounting standards. 8 Hours

MODULE-3

FINANCIAL ACCOUNTING PROCESS: Journalising transactions: Journals, Rules of Debit and Credit, Compound Journal Entry, Opening Entry. **Ledger posting and trial balance:** Ledger, Posting, Relationship between journal and ledger, Rules regarding posting, Trial Balance.

8 Hours

MODULE-4

SUB-DIVISION OF JOURNALS & NEGOTIABLE INSTRUMENTS

Sub-division of journals: Cash Journal, Petty Cash Book, Purchase Journal, Sales Journal, Sales Return Journal.

Negotiable Instruments: Promissory Note, Specimen of Promissory note, Bill of Exchange, Cheque, Some Important Terms, Accounting Entries, Billes sent for collection, Accommodation Bills, Bills receivable and payable books. 8 Hours

MODULE-5

BANK RECONCILIATION STATEMENT: Advantages of keeping a bank account, causes of difference, Meaning and Objectives of bank reconciliation statement, Importance of bank reconciliation statement, Technique of preparing bank reconciliation statement, where cash book balance has to be adjusted, Where the abstract from the Cash Book and Pass Book are given . 8 Hours

Teaching Methodology: Chalk and talk method / PowerPoint Presentation

COURSE OUTCOMES:

After the completion of the Course, students will be able to

CO 1. Explain the key functions of accounting and differentiate between bookkeeping and accounting.

CO 2. Describe core accounting principles and apply relevant accounting standards.

CO 3. Record transactions in journals and post them to ledgers accurately.

CO 4. Manage different types of journals and understand the accounting of negotiable instruments.

CO 5. Prepare a bank reconciliation statement and identify discrepancies between bank and cash records.

Suggested Learning Resources:

Books

1. An Introduction to Accountancy, 12/e, Dr S N Maheshwari, CA Sharad K Maheshwari & Dr Suneel K Maheshwari, Vikas Publishing.

Reference:

1. Fundamentals of Financial Accounting" by Ashok Banerjee Publisher: Excel Books
2. Accounting for Management: Text and Cases, 3/e, S K Bhattacharyya, John Dearden & S Venkatesh, Vikas Publishing

INDIAN KNOWLEDGE SYSTEMS		SEMESTER	I
Course Code	**25BCT106**	CIE Marks	50
Teaching Hours/Week (L: P: SDA)	2:0:0	SEE Marks	50
Total Hours of Pedagogy	25	Total Marks	100
Credits	02	Exam Hours	02
Type of the Course	Theory (MCQ)		

- To facilitate the students with the concepts of Indian traditional knowledge and to make them understand the Importance of roots of knowledge system.
- To make the students understand the traditional knowledge and analyze it and apply it to their day-to-day life.

MODULE-1

Introduction to Indian Knowledge Systems (IKS): Overview, Vedic Corpus, Philosophy, Character scope and importance, traditional knowledge vis-a-vis indigenous knowledge, traditional knowledge vs. western knowledge. 8Hours

MODULE-2

Traditional Knowledge in Humanities and Sciences: Linguistics, Number and measurements-Mathematics, Chemistry, Physics, Art, Astronomy, Astrology, Crafts and Trade in India and Engineering and Technology. 8 Hours

MODULE-3

Traditional Knowledge in Professional domain: Town planning and architecture-Construction, Health, wellness and Psychology-Medicine, Agriculture, Governance and public administration, United Nations Sustainable development goals. 9 Hours

Teaching Methodology: Chalk and talk method / Power Point Presentation

COURSE OUTCOMES:

After the completion of the Course, students will be able to

CO 1. Provide an overview of the concept of the Indian Knowledge System and its importance.

CO 2. Appreciate the need and importance of protecting traditional knowledge.

CO 3. Recognize the relevance of Traditional knowledge in different domains.

CO 4. Establish the significance of Indian Knowledge systems in the contemporary world.

CO 5. Perceive Indian philosophy to gain knowledge.

SUGGESTED LEARNING RESOURCES:

Books

1. **Introduction to Indian Knowledge System- concepts and applications**, B Mahadevan, Vinayak Rajat Bhat, Nagendra Pavana R N, 2022, PHI Learning Private Ltd, ISBN-978-93-91818-21-0
2. **Traditional Knowledge System in India**, Amit Jha, 2009, Atlantic Publishers and Distributors (P) Ltd., ISBN-13: 978-8126912230
3. **Knowledge Traditions and Practices of India**, Kapil Kapoor, Avadesh Kumar Singh, Vol1, 2005, DK Print World (P) Ltd., ISBN 81-246-0334

Suggested Web Links:

1. https://www.youtube.com/watch?v=LZP1StpYEPM
2. http://nptel.ac.in/courses/121106003/
3. https://unctad.org/system/files/official-document/ditcted10_en.pdf
4. http://nbaindia.org/uploaded/docs/traditionalknowledge_190707.pdf
5. https://unfoundation.org/what-we-do/issues/sustainable-development-goals/?gclid=EAIaIQobChMInp-Jtb_p8gIVTeN3Ch27LAmPEAAYASAAEgIm1vD_BwE

PROGRAMMING IN C LABORATORY		SEMESTER	I
Course Code	**25BCL107**	**CIE Marks**	50
Teaching Hours/Week (L: P: SDA)	1:2:0	**SEE Marks**	50
Total Hours of Pedagogy	14 Sessions	**Total Marks**	100
Credits	02	**Exam Hours**	03
Type of the course	Practical		

COURSE OBJECTIVES:

- Write C programs to perform basic operations such as calculations, comparisons, and data manipulation.
- Implement and demonstrate control structures like loops, conditionals, and switch-case statements in C.
- Manipulate arrays and strings, including operations like finding duplicates, reversing, and applying string functions.
- Demonstrate the use of pointers for advanced operations like swapping numbers and matrix manipulation, and work with structures to manage complex data types.

PART-A

1. Print the value of y for given x=2 & z=4 and analyze the output.
    a. y = x++ + ++x;
    b. y= ++x + ++x;
    c. y= ++x + ++x + ++x;
    d. y = x>z;
    e. y= x>z? x:z;
    f. y = x&z;
2. Program to read two numbers and find the largest (demonstration on if else).
3. Program to read percentage of marks and to display appropriate message (demonstration of switch case statement).
4. Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers (demonstration of do-while loop).
5. Write a program to print sums of even numbers and sum of odd numbers from array of positive integers (demonstration of 1D array).

6. Program to implement built-in string functions.
7. Program to demonstrate call by value and call by reference.

PART-B

1. Program to demonstrate library functions in math.h (demonstration of built-in functions).
2. Program to find the roots of quadratic equation (demonstration of else-if ladder)..
3. Program to read a number, find the sum of the digits, reverse the number and check it for palindrome (demonstration of while loop).
4. Program to generate n Fibonacci sequence (demonstration of for loop).
5. Program to perform addition and subtraction of Matrices (demonstration of 2D array).
6. Program to check a number for prime by defining isprime( ) function (demonstration of user-defined function).
7. Program to accept USN, Student Name, marks of any 6 Subjects and calculate total marks, Percentage, grade and print the all the details in marks card format of a particular student (demonstration of structure).

Teaching Methodology: Chalk and talk method / PowerPoint Presentation

COURSE OUTCOMES:

After the completion of the Course, students will be able to

CO 1. Develop the C Program which includes the structure of a C program, Tokens, Expressions, Operators etc.

CO 2. Demonstrate conditional and iterative statements to write C programs.

CO 3. Construct C programs that use arrays and strings.

CO 4. Design user defined functions to solve real time problems.

CO 5. Demonstration of Structure concepts & Pointers.

ESSENTIALS OF COMPUTER LABORATORY		SEMESTER	I
Course Code	**25BCL108**	CIE Marks	50
Teaching Hours/Week (L: P: SDA)	1:2:0	SEE Marks	50
Total Hours of Pedagogy	14 Sessions	Total Marks	100
Credits	02	Exam Hours	03
Type of the Course	Practical		

COURSE OBJECTIVES:

- Learn to identify computer peripherals and components, assemble and disassemble them, and troubleshoot basic hardware issues.
- Gain skills in installing various operating systems, configuring system settings, and maintaining the system using built-in tools.
- Develop proficiency in using word processors, spreadsheets, presentation software, and internet browsers for various tasks.
- Acquire the ability to edit multimedia content and create flowcharts using Flowgorithm software for basic programming tasks.

PART-A

1. Word Processor assignment to demonstrate usage of Page Setup, Page Background and Paragraph option of Page Layout tab by writing the description about Computer and its characteristics.
2. Word Processor assignment to demonstrate Bullets and Numbering, Headers and footers.
3. Word Processor assignment to demonstrate usage of mail merge by creating a letter to invite your parents for the annual day event. Prepare at least 5 letters.
4. Word Processor assignment to demonstrate usage of tables and encryption by preparing the timetable.
5. Demonstrate usage of formulas and charts in spreadsheet as directed below:
    a. Create a spreadsheet with following components:

SL No	Student Name	Sub 1	Sub 2	Sub 3	Total	Percentage	Grade

    b. Insert the name and marks of 3 subjects of 5 or more students.
    c. Calculate total marks obtained and percentage.

d. Calculate the grade by applying following criteria:
    i. If percentage >=90, then grade A
    ii. If percentage >=75 and <90, then grade B
    iii. If percentage >=60 and <75, then grade C
    iv. If percentage >=50 and <60, then grade D
    v. If percentage <50, then grade E
e. Insert column charts for various subjects
f. Insert pie chart for one student depicting composition of 3 subject marks.

6. Demonstrate usage of data validation in the spreadsheet as directed below:
    a. Create a spreadsheet with following components:

Emp No	Emp Name	Gender	Designation	DOB	Age	Basic Salary	DA	HRA	Gross Salary	Deduction	Net Salary

    a. Insert 5 employee details in the columns Emp No., Emp Name, DOB, Basic Salary.
    b. Add drop-down data validation for Gender and Designation columns
    c. Add a formula to calculate Age based on DOB
    d. Add the formula to calculate
        i. DA as 35% of Basic salary,
        ii. HRA as 25% of Basic salary
        iii. Deduction as 10% of Basic salary
    e. Add the formula to calculate Gross Salary and Net Salary

7. Demonstrate conditional formatting in spreadsheet as directed below:
    a. Create an attendance spreadsheet for 10 students.

USN	Name	Date 1	Date 2	Date 3	-	Date N	No. of Classes Attended	Attendance Percentage

    b. Mark P for present and A for absent for respective dates.
    c. Apply formula to calculate “No. of classes attended” and “Attendance Percentage” columns.

d. Apply conditional formatting to highlight a student if "Attendance Percentage" is less than 85%.

8. Create a power-point presentation to demonstrate the following:
    a. Layout option
    b. Insertion of date, time and slide numbers
    c. Insertion of Symbols
9. Create a power-point presentation to demonstrate the following:
    a. Themes
    b. Transitions
    c. Animation
10. Create a power-point presentation to demonstrate the following:
    a. Rehearse Timings
    b. Narrations
    c. Slide Sorter

PART-B

1. Introduction to LaTeX Software
    a. Install LaTeX software on your system.
    b. Create a simple LaTeX document.
    c. Compile the document to generate a PDF output.
    d. Explore and explain the structure of a basic LaTeX document (preamble, document body, etc.).
2. Working with LaTeX Templates
    a. Download a predefined LaTeX template (e.g., article, report).
    b. Customize the template by adding your name, title, and date.
    c. Add different sections and subsections to organize the content.
    d. Compile and review the document structure.
3. Including Text in LaTeX
    a. Create a new LaTeX document using the article template.
    b. Add paragraphs of text, including bold, italic, and underlined text.

c. Implement lists (ordered, unordered, and description lists).

d. Use special characters and symbols in the text.

4. Creating Tables in LaTeX

a. Create a LaTeX document and include a table using the `tabular` environment.

b. Add rows, columns, and format the table with borders.

c. Merge cells horizontally and vertically.

d. Include a caption and label for the table for referencing.

5. Incorporating Math Formulae and Generating Reports

a. Create a LaTeX document to write mathematical equations using the `equation` and `align` environments.

b. Include inline and display-style equations.

c. Add Greek symbols, fractions, and superscripts/subscripts.

d. Compile the document to generate a final report with a title page, table of contents, and numbered sections.

Teaching Methodology: Chalk and talk method / PowerPoint Presentation / Installation Videos

COURSE OUTCOMES:

After the completion of the Course, students will be able to

CO 1. Understand the identification, assembly, disassembly, and basic troubleshooting of computer hardware components, including peripherals, CPU, and system hardware.

CO 2. Gain hands-on experience with networking basics, including LAN and WiFi setup and configuration.

CO 3. Develop practical skills in installing and configuring various operating systems, including Windows, UNIX/Linux, and dual booting, along with system maintenance using BIOS settings, Registry Editor, and third-party tools.

CO 4. Enhance proficiency in using office productivity software, including word processors, spreadsheets, presentation tools, and multimedia editing software.

CO 5. Apply logical thinking to create flowcharts and perform tasks using flowgarithms software for arithmetic operations, shape area calculations, and understanding arrays and recursion.

ENVIRONMENTAL STUDIES		SEMESTER	I
Course Code	**25BCT109**	CIE Marks	50
Teaching Hours/Week (L: P: SDA)	0:0:2	SEE Marks	50
Total Hours of Pedagogy	24	Total Marks	100
Credits	01	Exam Hours	03
Type of Course /Subject	Theory(MCQ)		

COURSE OBJECTIVES:

- To explore methods for the sustainable use and conservation of resources such as water, soil, minerals, and biodiversity.
- To explore the social, economic, and ethical dimensions of environmental issues.

MODULE-1

Introduction to Environmental Studies: Multidisciplinary nature of environmental studies. Scope and importance; Concept of sustainability and sustainable development.

Ecosystems: What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems:

a) Forest ecosystem
b) Grassland ecosystem
c) Desert ecosystem
d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Natural Resources: Renewable and Non-Renewable Resources

a) Land resources and land-use change; Land degradation, soil erosion and desertification.
b) Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
c) Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (International & Inter-state).
d) Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

6 Hours

MODULE-2

Biodiversity and Conservation

a) Levels of biological diversity: Genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hotspots.
b) India as a mega-biodiversity nation; Endangered and endemic species of India.
c) Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
d) Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

6 Hours

MODULE-3

Environmental Pollution

a) Environmental Pollution: Types, causes, effects and controls; Air, water, soil and noise pollution.
b) Nuclear hazards and human health risks.
c) Solid waste management, Control measures of urban and industrial waste.
d) Pollution case student system; Banking complaints and Ombudsman
e) Pollution case student system; Banking complaints and Ombudsman

4 Hours

MODULE-4

Environmental Policies and Practices

a) Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.
b) Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and Control of Pollution) Act; Wildlife (Protection) Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
c) Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

4 Hours

MODULE-5

Human Communities and the Environment

a) Human population growth: Impacts on environment, human health and welfare.

b) Resettlement and rehabilitation of project affected persons; case studies.

c) Disaster management: Floods, Earthquake, Cyclones and Landslides.

d) Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.

e) Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.

f) Environmental communication and public awareness, case studies (e.g., CNG vehicles in cities).

4 Hours

Teaching Methodology: Chalk and talk method / PowerPoint Presentation

COURSE OUTCOMES:

After the completion of the Course, students will be able to

CO 1. Explain the roles and responsibilities of various stakeholders in environmental management and policy-making.

CO 2. Teach the principles and practices of natural resource conservation and management.

CO 3. Provide an understanding of the structure and function of natural ecosystems and the relationships between organisms and their environment.

CO 4. Demonstrate the impact of human activities on the environment, including urbanization, industrialization, deforestation, and climate change.

CO 5. Demonstrate the use and management of natural resources**.**

Suggested Learning Resources:

Books

1. Bharucha, E. (2015). Textbook of Environmental Studies.

References

1. Carson, R. (2002). Silent Spring. Houghton Mifflin Harcourt.
2. Climate Change: Science and Politics. (2021). Centre Science and Environment, New Delhi.
3. Gadgil, M., & Guha, R. (1993). This Fissured Land: An Ecological History of India. Univ. of California Press