SIGMA UNIVERSITY

Faculty of Computer Science & Applications

BSc (IT) - Bachelor of Science in Information Technology

First Year

Sem	Course Code	Course Name	Theory (T)	Tutorial (T)	Practical (P)	Hrs	Credit
I	1BBM01	Basis of Mathematics	3	0	0	3	3
I	1BCA01	Computer Fundamentals	3	0	0	3	3
I	1BCA02	Computer Programming	3	0	4	7	5
I	1BCA03	Web Technology	2	0	4	6	4
I	1BCA04	Introduction to Digital Logic Fundamentals	2	2	0	4	3
I	1BCS01	Basic Communication Skills	2	0	0	2	2
I	2BOA01	Office Automation	0	0	4	4	2
I	1NCC01/1NSS01/1SPO01	NCC/NSS/Sports (I)	0	0	2	2	0
			15	**0**	**14**	**31**	**22**

Sem	Course Code	Course Name	Theory (T)	Tutorial (T)	Practical (P)	Hrs	Credit
II	2BDM01	Discreet Mathematics & Calculus	3	0	0	3	3
II	2BCA01	Basic Programming with Python	2	0	4	6	4
II	2BCA02	Data Structure	2	0	2	4	3
II	2BCA03	Advance Web Technology	2	0	4	6	4
II	2BCA04	Object Oriented Principles with Programming Methods	2	2	0	4	3
II	2BAC01	Advance Communication Skills	2	0	0	2	2
II	1BES01	Environmental Science and Sustainable Development	3	0	0	3	3
II	2NCC01/2NSS01/2SPO01	NCC/NSS/Sports (I)	0	0	2	2	0
			16	**2**	**12**	**30**	**22**

Semester – I
Detailed Syllabus
F.Y. 2023-24

Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Science - Information Technology (BSc. IT)
Course Code	:	1BBM01
Course Title	:	Basis of Mathematics
Type of Course	:	Basic Science
Year of Introduction	:	2023-24

Prerequisite	:	-	
Course Objective	:		To understand the rate of change, convergence, divergence, Cartesian, and polar system.
Course Outcomes	:		At the end of this course, students will be able to:
	CO 1		Understand the matrix use to solve any linear system of equations
	CO 2		Understand different techniques to solve first order difference equation and behaviour of the student at future time.
	CO 3		Understand the various and appropriate test for convergence of the sequence and series
	CO 4		Understand how the improper integration can be solved
	CO 5		Understand how area and volume can be find by double and triple integration

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	**T**	**P**	**C**	**SEE**	**CIA**	**SEE**	**CIA**	
3	0	0	3	70	30	0	0	100

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P**–Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	**Matrices:** Concept of Matrix, Types of Matrices, Addition, Subtraction and multiplication by scalar of matrices, Product of two matrices Adjoint, Inverse and Rank of matrices.	10	25%	CO 1
2	**Set Theory:** Basic concept of set theory: Definition, Equality of set, Cartesian product, The power set, some operation of set, Venn diagram, Some basic set identities.	8	20%	CO 2

3	**Boolean algebra:** Definition of Boolean algebra as algebraic structures with two operations basic results truth values and truth tables, laws, and theorems of Boolean algebra, De-Morgan's theorem.	10	25%	CO 3
4	**Graphs:** Graphs terminology, Representing Graphs, Directed and undirected graphs and their matrix representations, **Trees:** Definition of trees, Branch nodes, leaf notes, root, Examples: Representation of tree Examples: binary tree, m-ary tree and complete binary tree.	12	30%	CO 4

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**40**	**40**	**20**	-	-	-

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Echelon and row Echelons	2
2	Rank of the matrix and solution of system of linear equation	2
3	Solution of Ordinary Differential equation	2
4	Exact and Non Exact differential equation	2
5	Convergence and divergence of sequence and series	2
6	Power series	2
7	Convergence and Divergence of improper integration	2
8	Beta and Gamma Functions	2
9	Algebraic structure	2
10	Truth values and truth table	2

Suggested Learning Websites

Sr. No.	Name of Website
1	https://semesters.in/engineering-mathematics-for-btech-first-year/
2	https://www.nptel.ac.in
3	https://tutorial.math.lamar.edu/classes/calci/calci.aspx
4	https://www.khanacademy.com

Reference Books

Sr. No.	Name of Reference Books
1	Erwin Kreyszig, Advanced Engineering mathematics, John Wiley, 10th Ed., 2015.
2	B. S Grewal, Higher Engineering Mathematics, (43rd Edition), Khanna Pub., Delhi (2014).
3	B V Ramana, Higher Engineering Mathematics; McGraw-Hill
4	D C Lay, Linear Algebra and its Application; Pearson Publication
5	Mathematics 1 By Dr R C Shah
6	R. K. Jain and S. R. K. Iyernagar, Advanced Engineering Mathematics, Alpha Science, 3rd Ed., 2007.
7	Discrete Mathematics By Dr Purnima P. Patwardhan, Technical publication.

Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Science - Information Technology (BSc. IT)
Course Code	:	1BCA01
Course Title	:	Computer Fundamentals
Type of Course	:	Professional Core
Year of Introduction	:	2023-24

Prerequisite	:	-
Course Objective	:	Understanding Computer Characteristics, Hardware, Software, and Generations of computer, Types of computers and its applications of various Fields. Understanding working of Computer Functional Block and Structure of Digital Computer. Input/Output Devices and usages, Computer Memory, Computer Language, the various Compute Operating System & it's functions, the concept of Networking and its types.
Course Outcomes	:	At the end of this course, students will be able to:
	CO 1	Understanding Computer Characteristics, Hardware, Software, Evolution of computer and Generations, and different Types of Computers and its Applications of Computer in Various Fields.
	CO 2	Understanding working of Computer Functional Block and Structure of Digital Computer.
	CO 3	Learn Input/Output Devices and usages
	CO 4	Grasp the Concept of Computer Memory- types, Devices, and usages
	CO 5	Understand the various Computer Language and Software
	CO 6	Understand the various Compute Operating System Functions and various type of OS.
	CO 7	Understand the concept of Networking and its types

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
3	0	0	3	70	30	0	0	100

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P** – Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars /Presentations/MCQ Tests, etc.)*

Course Content

Unit no.	Topics	Hrs.	Weightage	Mapping with CO
1	**Introduction to Computer:** Computer Characteristics, Concept of Hardware, Software, Evolution of computer and Generations, Types of Computers – Analog and Digital computers, Hybrid Computers, General Purpose and Special Purpose Computer, Limitations of Computer Applications of Computer in Various Fields.	4	10%	CO 1
2	**Structure and Working of Computer:** Functional Block Diagram of Computer. CPU, ALU, Memory Unit, Bus Structure of Digital Computer – Address, Data and Control Bus.	4	15%	CO 2
3	**Input/Output Devices:** Input Device – Keyboard, Mouse, Scanner, MICR, OMR. Output Devices – VDU, Printers – Dot Matrix, Daisy-wheel, Inkjet, Laser, Line Printers and Plotters.	3	15%	CO 3
4	**Computer Memory:** Memory Concept, Memory Cell, Memory Organization, Semiconductor Memory – RAM, ROM, PROM, EPROM, Secondary Storage Devices – Magnetic Tape, Magnetic Disk (Floppy Disk and Hard Disk.), Compact Disk.	4	10%	CO 4
5	**Computer Language and Software:** Algorithm, Flowcharts, Machine Language, Assembly Language, High Level Language, Assembler, Compiler, Interpreter. Characteristics of Good Language. Software – System and Application Software.	5	15%	CO 5
6	**Operating System:** Operating System, Evolution of Operating System. Functions of Operating System. Types of Operating Systems. Detailed Study of Windows Operating System. Introduction and Features of LINUX OS.	6	15%	CO 6
7	**Networking:** Concept, Basic Elements of a Communication System, Data Transmission Media, Topologies, LAN, MAN, WAN, Internet	6	20%	CO 7

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**40**	**40**	**20**	-	-	-

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Dismantling the system unit, , describe function of each component and define the relationship of internal components.	04
2	Recognize all major components inside a PC	04
3	Describe function of each component and define the relationship of internal components	04
4	Introduce input and out device	04
5	To Familiarize with different computer language.	04
6	To Familiarize with different operating system concepts.	04
7	To familiarize with different networks.	04

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Computer System with latest configuration along with Windows Operating System
2	MS-Office 2007

Suggested Learning Websites

Sr. No.	Name of Website
1	https:// www.tutorialspoint.com/computer_fundamentals/index.htm
2	https:// www.tutorialsmate.com/2020/04/computer-fundamentals-tutorial.html

Reference Books

Sr. No.	Name of Reference Books
1	Computer Fundamentals, Pradeep Sinha &Priti Sinha, BPB Publications
2	Fundamentals of Computers By V. Rajaraman, Neeharika Adabala, PHI Press

Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Science - Information Technology (BSc. IT)
Course Code	:	1BCA02
Course Title	:	Computer Programming
Type of Course	:	Professional Core (PC)
Year of Introduction	:	2023-24

Prerequisite	:	-
Course Objective	:	This program empowers students by learning problem solving skills, development of algorithms and drawing flowcharts to solve simple problems, the process of compiling and executing a C program. Understanding various C tokens, datatypes, programming constructs, file, structure, pointers, and analyse how length of the source program can be reduced by using functions. Develop C Programs using various methods described above to solve real-world problems.
Course Outcomes	:	At the end of this course, students will be able to:
	CO 1	Demonstrate problem solving skills by developing algorithms and drawing flowcharts to solve simple problems, Understand the process of compiling and executing a C program and recognize various C tokens and datatypes
	CO 2	Understanding various programming constructs and applying it for the problemsgiven in hand.
	CO 3	Demonstrate the use of various data structures like array, file, and structure.
	CO 4	Applying the concepts of top-down modular programming to decompose problem and a program solution into smaller pieces and Analyse how length of the source program can be reduced by using functions.
	CO 5	Evaluate how pointers are effective in handling arrays, functions, and data tablesand how pointers support Dynamic memory management.
	CO 6	Develop C Programs using various methods described above to solve real-world problems.

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
2	0	4	4	70	30	30	20	150

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P** – Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations /MCQ Tests, etc.))*

Course Content

UNIT No.	Topics	No. of Lectures	Weightage	Mapping with CO
1	**Introduction to 'C' language:** Program, Software, Instruction, debugging, compilation and execution of C Program, Difference between Header files & library files, Compiler, and Interpreter, Procedure Oriented Language, Importance of C, Basic structure of C, Algorithms & Flowchart.	2	5%	CO 1 CO 2
2	**Constants, Variables & Data Types in 'C':** Character set, C tokens, Keywords & Identifiers, Data types, Constants, Variables, Declaration of Variables, Assigning Values to Variables, Declaring a variable as Constant, Defining Symbolic constants.	3	6%	CO 1 CO 2
3	**Operators and Expression in 'C':** Classification of operators: Arithmetic, Relational, Logical, Assignment, Increment / Decrement, Conditional, Bitwise, Special Operators. Unary, Binary and Ternary Operators. Arithmetic expression, Evaluation, Type conversion: Implicit &Explicit, Precedence and Associativity, Various library functions from maths.h.	3	6%	CO 1 CO 2
4	**Managing Input & Output Operations:** Reading a Character, Writing a Character, Various library functions from ctype.h. Formatted Input, Formatted Output	1	2%	CO 1 CO 2
5	**Decision Making & Branching:** Decision making using simple if, if…else statement, nesting of if…else, else…if Ladder. Switch statements, conditional operator, goto statement.	3	6%	CO 2 CO 4
6	**Looping:** Need of looping, (pre-test) entry-controlled loop: while, for, (post-test) exit-controlled loop: do…while, difference between Counter- Controlled loops and Sentinel - controlled loops. Nesting of looping statements, use of break & continue, use of if…else in loop, infinite loop.	3	8%	CO 2 CO 4
7	**Arrays:** Need of array, Declaration & Initialization of 1D array, Programs of 1D. 2D array, Memory allocation of 1D and 2D array, 2D array basic programs.	4	8%	CO 3 CO 5
8	**Character Arrays and Strings:** Difference of character array with numeric array and importance of NULL character. Declaration, Initialization and various input and output methods of string, formatted output of string, arithmetic operations on characters. Various functions of string.h: strlen, strcat, strcmp, strcpy, strrev, strstr, etc. Two dimensional character array (table of strings).	5	10%	CO 3 CO 5

9	**User-Defined Function in 'C'**: Need of modularization, advantages, Introduction to user- defined function, Function Prototype, Function Call, Function Body. Call by value, Actual &Formal Arguments, return value, Categories of functions, Nesting of Functions, Recursion. Array as Function arguments, Storage Classes: Scope, Life of a variable in 'C'.	5	14%	CO 5
10	**Structures and Union:** Need of user-defined data type, Structure definition, Declaration and Initialization of variables, Array as member, Array of structure variables. Structure within structure, Structure as function arguments, Union.	3	8%	CO 5
11	**Pointers:** Introduction to pointer, declaration & initialization, access value using pointer, indirection (*) operator. Pointers in expressions, scale factor, 1D-array and pointer, pointer with strings, Array of pointers. Pointer as arguments in function, Call by address, Functions returning pointers, Pointers and structures, Chain of Pointers.	6	14%	CO 5
12	**File Management in 'C':** Introduction, Defining and Opening a file, closing a file, modes of file, read & write single character and integer to file, use of fprintf and fscanf functions. Error handling functions, random access of files using ftell, rewind, fseek, command line argument.	5	8%	CO 5 CO 6
13	**Dynamic Memory Allocation:** Introduction, memory allocation process. Use of functions: malloc ( ), calloc ( ), realloc ( ) and free ( ).	2	5%	CO 6

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**30**	**40**	**30**	-	-	-

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Write a C program to display "This is my first C Program".	2
2	Write a Program to calculate and display the volume of a CUBE having its height (h=10cm), width (w=12cm) and depth (8cm).	2
3	Write a C program to add two numbers (2 and 6) and display its sum.	2
4	Write a program to take input of name, roll_no and marks obtained by a student in 4 subjects of 100 marks each and display the name, roll_no with percentage score secured.	2
5	Write a program to print whether a given number is even or odd.	2

6	Write a program to find whether a character is consonant or vowel using. **switch** statement.	2
7	Write a program to print positive integers from 1 to 10.	2
8	Write a program to display the following pattern. * * * * * * * * * * * * * * *	2
9	Write a program to display the following pattern. * * * * * * * * * * * * * * * * * * * *	2
10	Write a program to insert 5 elements into an array and print the elements ofthe array.	2
11	Write a program to calculate factorial of a number using recursion.	2
12	Write a program to find biggest among three numbers using pointer.	2
13	Write a program to add two 2 X 2 matrix using pointers.	2
14	Write a C program to create, declare and initialize structure.	2
15	Write a program to store information of 5 students in structure and display	2
16	Write a program to declare, initialize an UNION.	2
17	Write a program to create a file called emp. rec and store information abouta person, in terms of his name, age and salary.	2
18	Write a program to illustrate how a file stored on the disk is read.	2

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	DEV C++ , Microsoft C , Turbo C

Suggested Learning Websites

Sr. No.	Name of Website
1	https://www.programiz.com/c-programming
2	https://www.javatpoint.com/c-programming-language-tutorial

Reference Books

Sr. No.	Name of Reference Books
1	Head First C by David Griffiths and Dawn Griffiths
2	C How to program, 7/E by Deitel & Deitel, Prentice Hall
3	C: The Complete Reference by Herbert Schildt

Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Science - Information Technology (BSc. IT)
Course Code	:	1BCA03
Course Title	:	Web Technology
Type of Course	:	Professional Core
Year of Introduction	:	2023-24

Prerequisite	:	-	
Course Objective	:	The increasing use of Internet and WWW encourages everyone to use web- based solutions for their requirements. Web technology refers to the methods by which End-user devices like computers/mobiles communicate with each other. This communication involves the use of web publishing languages like HTML, CSS, JavaScript. This subject will attempt to give you a basic understanding of various aspects of web technologies.	
Course Outcomes	:	At the end of this course, students will be able to:	
	CO 1	To understand and compare the fundamentals of Web hosting and domain nameservices. (Analysis)	
	CO 2	To understand various non-browser specific web design principles. (Knowledge)	
	CO 3	To understand the need and be able to develop HTML/XHTML and CSS pages withvalid structure as well as content. (Synthesis)	
	CO 4	To understand and be able to develop JavaScript/jQuery code to access the DOMstructure of web document and object properties.	

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total
L	T	P	C	SEE	CIA	SEE	CIA	Marks
2	0	4	4	70	30	30	20	150

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P** – Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars /Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping With CO
1.	**HTML:** Basics of HTML, HTML Tags and attributes, Meta tags, Character entities, hyperlink, lists, tables, images, forms, divs, XHTML	5	20%	CO 1 CO 2 CO 3
2.	**CSS:** Basics of CSS, CSS properties for manipulating texts, background, colors, Gradients, Shadow Effects, borders, margins, paddings, transformations, transitions, and animations, etc., CSS box modal and CSS Flex, Positioning systems of CSS, CSS media queries.	5	20%	CO 1 CO 2 CO 3
3.	**JavaScript:** Basics of JavaScript and Client-side scripting language, JavaScript syntaxes for variables, functions, branches and repetitions. JavaScript alert, prompt and confirm. Objects in JavaScript, Access/Manipulate web browser elements using DOM Structure, forms and validations, JavaScript events,	10	30%	CO 2 CO 4
4.	**JQuery:** Basics of jQuery, jQuery syntaxes, jQuery selectors, events, effects, Access/Manipulate web browser elements using jQuery	5	15%	CO 2 CO 4
5.	**Bootstrap:** Introduction, different components, grid, plug-in	5	15%	CO 2 CO 4

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**30**	**30**	**40**	-	-	-

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Write a HTML program for demonstrating Hyperlinks. a. Navigation from one page to another. b. Navigation within the page.	8
2	Write a HTML program for time-table using tables.	8
3	Write a HTML program to develop a static Home Page using frames.	4
4	Write a HTML program to develop a static Registration Form.	4
5	Write a HTML program to develop a static Login Page.	4
6	Write a HTML program to develop a static Web Page for Catalog.	4
7	Write a HTML program to develop a static Web Page for Shopping Cart.	4

8	Write HTML for demonstration of cascading stylesheets. a. Embedded stylesheets. b. External stylesheets. c. Inline styles.	4
9	Write a JavaScript program to validate USER LOGIN page.	4
10	Write a JavaScript program for validating REGISTRATION FORM	4
11	jQuery: Disable right click menu in html page	4
12	jQuery: Fix broken images automatically	4
13	Any 5 Bootstrap Experiment	4

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Web browser
2	Notepad / Sublime text / Visual studio code

Suggested Learning Websites

Sr. No.	Name of Website
1	https:// www.w3schools.com/
2	https:// www.tutorialspoint.com/

Text books

Sr. No.	Name of Text Books
1	Black Book, HTML 5, Dreamtech Press
2	Black Book, Web Technologies, Dreamtech Press

References Books:

Sr. No.	Name of Reference Books
1	Ralph Moseley and M. T. Savaliya, Developing Web Applications, Wiley-India
2	Cody Lindley, jQuery Cookbook, O'Reilly Media
3	Ryan Benedetti, Ronan Cranley, Head First jQuery - A Brain-Friendly Guide, O'Reilly Media

Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Science - Information Technology (BSc. IT)
Course Code	:	1BCA04
Course Title	:	Introduction to Digital Logic Fundamentals
Type of Course	:	Professional Core
Year of Introduction	:	2023-24

Prerequisite	:	-	
Course Objective	:	This program empowers students to enhance their proficiency in Microsoft Office, acquire knowledge on the proper utilization of Google Apps and understand the importance of computer security.	
Course Outcomes	:	At the end of this course, students will be able to:	
	CO 1	Understand Number System & Perform number conversions.	
	CO 2	Identify the logic gates and their functionality.	
	CO 3	Perform number conversions from one system to another system	
	CO 4	Design basic electronic circuits (combinational circuits).	
	CO 5	Perform a comparative analysis of the components of different memory units.	

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
2	2	0	3	70	30	30	20	150

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P** – Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars /Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	**NUMBER SYSTEM AND CONVERSION :**Decimal Numbers, Binary Numbers, Hexadecimal Numbers, Octal Numbers, Conversions within Number systems	5	15%	CO 1 CO 3
2	**ARITHMETICS AND CODES:** Binary Arithmetic, 1's and 2's complements of Binary Numbers, Signed Numbers, Arithmetic Operations with Signed numbers, Digital Codes, Error Detection Codes.	7	10%	CO 3

3	**LOGIC GATES:** The Inverter, The AND gate, The OR gate, The NAND gate, NOR gate, The Exclusive-OR gate and Exclusive-NOR gate; Boolean Algebra and Logic Simplification – Boolean Operations and Expressions, Laws and Rules, De-Morgan's Theorems, Boolean Expressions and Truth Tables, The Karnaugh Map, SOP minimizations.	6	20%	CO 2
4	**COMBINATIONAL LOGIC ANALYSIS:** Basic combinational Logic Circuits, Implementing Combinational Logic, The Universal Property of NAND and NOR Gates. Functions of Combinational Logic - Basic Adder, Parallel Binary Adders, Comparators, Decoders, Encoders, Code Converters, Multiplexers, Parity Generator/Checkers.	8	20%	CO 2 CO 4
5	**LATCHES AND FLIP-FLOPS:** Latches, Edge Triggered Flip-Flops, Flip-Flop Operating characteristics, Flip-Flop Applications, Registers, Counters.	8	20%	CO 3
6	Memory Basics, The RAM, The ROM, Programmable ROMs, The Flash Memory, Memory Expansion, Special Types of Memories, Magnetic and Optical Storage.	6	15%	CO 4 CO 5

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**40**	**30**	**30**	-	-	-

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	**To study and verify the truth table of logic gates:** Identify various ICs and their specification. **a.** OR gate **b.** AND gate **c.** NAND gate **d.** NOR gate	4
2	**Realization of a Boolean function:** To simplify the given expression and to realize it using Basic gates and Universal gate	4
3	**Design and implementation using NAND gate:** To realize why NAND gate is known as the universal gate by implementation of: **a.** NOT using NAND **b.** AND using NAND **c.** OR using NAND **d.** XOR using NAND	4
4	**Adders and Subtractors:** To realize **a.** Half Adder and Full Adder **b.** Half Subtractor and Full Subtractor by using Basic gates and NAND gates	2

5	**Binary to grey generator:** To learn the importance of weighted and non weighted code To learn to generate gray code	2
6	**Multiplexer and Demultiplexer:** **a.** To design and set up a 4:1 Multiplexer (MUX) using only NAND gates. **b.** To design and set up a 1:4 Demultiplexer (DE-MUX) using only NAND gates.	4
7	**Realization of a Boolean function using Logisim Software:** To learn the use of Logisim software to design digital electronics circuits.	4
8	**Flipflop:** **a.** Truth Table verification of **1)** RS Flip Flop **2)** T type Flip Flop. **3)** D type Flip Flop. **4)** JK Flip Flop. **b.** Conversion of one type of Flip flop to another	4

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	IC trainer kit, Logic gate ICs, Patch chords, connecting wires.
2	Logisim Software

Suggested Learning Websites

Sr. No.	Name of Website
1	https://learn.sparkfun.com
2	https:// www.geeksforgeeks.org/

Reference Books

Sr. No.	Name of Reference Books
1	Floyd, Thomas L, "Digital Computer Fundamentals", 10th Edition, University Book Stall, 1997.
2	Malvino, Paul Albert and Leach, Donald P, "Digital Principles and Applications", 4th Edition, TMH, 2000.
3	Malvino, Paul Albert and Leach, Donald P, "Digital Computer Fundamentals", 3rd Edition, TMH, 1995.
4	Bartee, Thomas C, "Digital Computer Fundamentals", 6th Edition, TMH, 1995.

Name of Faculty	:	Faculty of Engineering & Technology
Name of Program	:	Bachelor of Technology (B. Tech)
Course Code	:	1BCS01
Course Title	:	Basic Communication Skills
Type of Course	:	Ability Enhancement (AE)
Year of Introduction	:	2023-24

Prerequisite	:	Knowledge of basic English
Course Objective	:	Understand of the fundamental elements of communication in English language. Know and understand different practices of verbal and non-verbal communication with inputs to improve basic language skills. Students are expected to be better equipped in the following areas: Listening: Understanding basic content in lectures and common everyday situations Speaking: Correct expression in the English language at a basic level Reading: Understanding, retaining, and critically analyzing technical/non-technical content Writing: Using appropriate vocabulary, grammar, effective paragraph construction, writing in day-to-day scenarios, including digital platforms
Course Outcomes	:	At the end of this course, students will be able to:
	CO1	Enables students to develop a strong foundation in English grammar, including the understanding of phonetic sounds, vocabulary building, and word formation processes.
	CO2	Students will be able to demonstrate proficiency in using proper prepositions and understanding subject-verb agreement, leading to improved accuracy in their written and spoken English.
	CO3	Students will enhance their critical thinking and communication skills through activities such as book reviews, speech and spoken exchanges, and role plays fostering creativity and effective expression.
	CO4	Enables students to develop effective listening skills, including overcoming accent difficulties and understanding the psychology of a listener, leading to improved comprehension of speakers.
	CO5	Enables students to acquire effective reading strategies and practice reading comprehension exercises, enabling them to become proficient and efficient readers.

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	**T**	**P**	**C**	**SEE**	**CIA**	**SEE**	**CIA**	
2	0	0	2	70	30	0	0	100

Legends: ***L**-Lecture;* ***T**–Tutorial/Teacher Guided Theory Practice;* ***P** – Practical,* ***C** – Credit,* ***SEE** – Semester End Examination,* ***CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	**Ice breaking Activity** This activity will help students connect with each other and work as a team. Students will be asked to introduce their new friend in the class, building strong bonds between classmates and breaking the ice. This activity encourages communication and socialization skills while fostering a positive classroom environment.	2	5%	CO3
2	**Phonetics:** IPA Introduction Phonic Sounds Pronunciation Practice including transcription	2	5%	CO1
3	**Vocabulary Building & Word Formation Process:** Compounding, clipping, blending, derivation, creative respelling, coining and borrowing. Prefixes & suffixes, synonyms & antonyms, standard abbreviations	4	10%	CO1
4	**Mine Activity: Usage of Preposition:** Students will learn to use proper propositions by active participation in the activity.	2	5%	CO2
5	**Nouns and Pronouns:** The class focuses on types of nouns, pronouns, their usages, It aims to build a strong base on the main part of speech in English Grammar. This is achieved through various exercises and activities.	2	5%	CO1
6	**Determiners and Articles:** Students are taught the difference between commonly mistaken determiners. The use of articles enables students to enhance the basic knowledge they possess. **Subject-Verb Agreement:**	2	10%	CO2

	Subject-Verb Agreement plays a major role in helping speakers of the English language use the language correctly. It is one of the most fundamental rules in English, and often the subject of aptitude questions. Students are trained on it with interesting examples and drills.			
7	**Book Review:** The learners will identify the central idea of the book, author's style and approach towards the book. This will enable the learners to express their point of view and hone their creativity and writing skills.	2	10%	CO3
8	**Speech and spoken Exchanges; Extempore:** Students will learn the correct usage of spoken language as different from the written form. It will help the students in extempore speech. This will be done by making the students give variety of impromptu speeches in front of the class: 1 minute talk on simple topics. To change the average speakers in the class to some of the best Orator.	2	10%	CO3
9	**Speaking Activity: Role play** Role Play activity topic gears towards making students do role play based on various scenarios. It involves giving them a scenario and asking them to further develop the idea in a very interesting manner, then going on to enact it.	2	5%	CO3
10	**Lifeboat:** This is a modern-day spin on the classic activity named Shipwreck. It aims to improve students' convincing skills.	2	0%	CO3
11	**Picture Connector:** In this class the students will be trained to form logical connections between a set of pictures which will be shared with them. This geared towards building creativity and presentation skills.	2	10%	CO2
	Tourism Pitch: Students are taught the art of making a marketing pitch based on scenarios provided to them. Thereby, their presentation and communication skills are enhanced.	2	5%	CO3
13	**Crazy Scientist:** The students will be taught the importance of invention and innovation using some examples that changed the world the way it worked.	2	10%	CO3
14	**Listening skills:** This class focuses on training students how to actively listen, How to understand the difficulties and psychology of a listener while communicating,	2	10%	CO4 & CO5

	How to overcome accent difficulties while listening to speakers of foreign origin. This is done in an interactive way filled with activities. **Reading Skills:** The art of effective reading and its various strategies to be taught to the learners and practice exercises be given on reading comprehension.			

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**15**	**15**	**15**	**15**	**20**	**20**

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Language lab (with computers)
2	Software Wordworth

Suggested Learning Websites

Sr. No.	Name of Website
1	http://www.englishexercise.org/makeagame/
2	http://www.learnloud.com/content/blogs
3	http://www.agendaweb.org/listening/audio-books.html
4	http://wwwbbc.co.uk/worldservice/learningenglishgrammer/pron/sounds/
5	http://www.agentaweb.org/listening/audio-bools.html
6	http://wwwgrammarbook.com
7	http://www.tatamcgrawhill.com
8	http://wwwcambridgeenglishhonline.com/phonetic_focus/
9	http://wwwesolcourses.com/contet/topicmenu/listening
10	http://www.audio-bools.html
11	http://wwwunhcrorg/afr/news/stories/2017/6/5941561f4/forceddisplacement-worldwide-its-highest-decadeshtml

Reference Books

Sr. No.	Name of Reference Books
1	The necklace, Guy de Maupassant, The Dramatic Publishing company Books,1965.
2	The Monkey's Paw, W. W. Jacobs, Perfection Learning, 1979.
3	English for Engineers and Technologists (combined Edition, Vol.1 and 2), Orient Black swan, 2006.
4	The King's speech (Movie), 2010.
5	Life od Pie (Movie), 2012.
6	A communicative Grammar of English, Geoffrey Leech and Prof Jan Svartvik Pearson Publication, 2013.
7	Wren and Martin High school English Grammar and composition, revised by N.D.V. Prasad Rao, S. Chandra Publishing, 2017.
8	Grammar is use Intermediate with answers, Raymond Murphy, Cambridge University Press, 2019.
9	How to survive the 21th century, Yuval Harari,2020.
10	Michael Swan Basic English Usage Oxford University Press 1984
11	Rodney Huddleson and Geoffrey K. Pullum A Student's Introduction to English Grammar Cambridge University Press 2005
12	P. N. Gopalkrishnan Book of Nouns Authors press 3 Michael Swan Basic English Usage Oxford University Press 1984
13	P. N. Gopalkrishnan Book of Adjectives Authors press

Name of Faculty	:	Faculty of Engineering & Technology
Name of Program	:	Bachelor of Technology (B. Tech)

Course Code	:	2BOA01
Course Title	:	Office Automation Tools
Type of Course	:	Skill Enhancement (SE)
Year of Introduction	:	2023-24

Prerequisite	:	-
Course Objective	:	This program empowers students to enhance their proficiency in Computer, and Microsoft Office, acquire knowledge on the proper utilization of Google Apps and understand the importance of computer security.
Course Outcomes	:	At the end of this course, students will be able to:
	CO1	Grasp the concept of computer, Operating System
	CO2	Utilize the features of Microsoft Office to generate project reports, spreadsheets, and presentations.
	CO3	Grasp the concept of computer hardware and networking, including the installation of operating systems and application programs.
	CO4	Understand concepts of various digital tools of Google and how to use it effectively

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
0	0	4	2	0	0	70	30	100

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P** – Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	**Introduction to Computer** Computer Characteristics, Concept of Hardware, Software, Evolution of computer and Generations, Types of Computers – Analog and Digital computers, Hybrid Computers, General Purpose and Special Purpose Computer, Limitations of Computer Applications of Computer in Various Fields, Various Operating Systems, Window OS feature	3	10%	CO1
2	**MS Word** Components of MS Word, File: Create, Edit, Save, Open, Image Insert, Table work, and Print Documents, Font, Line and Paragraph Format, Smart art, Page breaks, Spelling and Grammar Check, Mail Merge	2	20%	CO2
3	**MS Excel** Introduction of Spreadsheet: Create, Edit, Save, Print, functions & formulas, Worksheets modification with colour & auto-formats, Charts & Graphs, Data Entry with Speed, Filtering Data	3	20%	CO2
4	**MS PowerPoint** Components of MS PowerPoint: Create, Open, view, print slides, layouts editing, custom animation, slide transitions, Charts & Graphs, Professional Slide for Presentation	2	10%	CO2
5	**Internet and Advanced Communication** Definition & History of Internet, Uses of Internet, Definition of Web Addressing-URL-Different types of Internet Connections: Dial up connection, Broad band, Wi-Fi, browsers, Internet browsing - Search Engines **Advanced Communication:** Creating an email-ID, e-mail reading, saving, printing, forwarding and deleting the mails, checking the mails, viewing and running file attachments, addressing with cc and bcc	3	20%	CO1 CO3
6	**Google Apps** Google Chrome, Gmail, Google Calendar, Google Search, Google Docs, Google Sheets, Google Presentations, Google Maps, Google Drive, Google Contacts	2	20%	CO4

Suggested Distribution of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**40**	**20**	**30**	**-**	**-**	**10**

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Ms Word – Document Preparation	6
2	Ms Excel – Profession Spreadsheet Preparation	6
3	Ms PowerPoint – Professional Presentation	6
4	E-mail Creation and Sending with Attachment, CC & BCC	6
5	Use of Google Applications	6

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Microsoft Office: Ms Word, Ms Excel, Ms PowerPoint
2	Google Essentials

Suggested Learning Websites

Sr. No.	Name of Website
1	https://workspace.google.com/
2	https://support.microsoft.com/en-us/training

Reference Books

Sr. No.	Name of Reference Books
1	Microsoft Office 365 by Katherine Murray
2	The Google Apps Guidebook: Lessons, Activities and Projects Created by Students for Teachers by Kern Kelley	EdTech team Press

Semester – II
Detailed Syllabus
F.Y. 2023-24

Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Science - Information Technology (BSc. IT)
Course Code	:	2BDM01
Course Title	:	Discreet Mathematics & Calculus
Type of Course	:	Basic Science
Year of Introduction	:	2023-24

Prerequisite	:	Basics of Mathematics	
Course Objective	:	Different Techniques to solve higher order ODEs, Direction and magnitude studies, PDEs	
Course Outcomes	:	At the end of this course, students will be able to:	
	CO 1	To calculate line integral , use of grad, div and curl, green and stock's theorem	
	CO 2	Apply different techniques to solve higher order ODEs	
	CO 3	Understand the rate of change when more than one independent variables present, apply partial derivative equation techniques to predict the behaviour of certain phenomena.	
	CO 4	To represent Fourier series and integral of periodic function	
	CO 5	To solve initial-value problems for linear differential equations with constant coefficients.	

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	**T**	**P**	**C**	**SEE**	**CIA**	**SEE**	**CIA**	
3	0	0	3	70	30	0	0	100

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P**–Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	**Permutation and combination:** Introduction, rule of sum and product, combination-permutation, circular and restricted permutation, permutation with repetition of objects, principal of mathematical introduction.	10	25%	CO 1
2	**Functions and Relation:** Introduction to function, one to one function, onto function ,floor function,	8	20%	CO 2

	Ceiling function, Big-O notation ,Big-omega ,Big-Theta notation.			
3	**Differentiation:** Derivative, Derivatives of Sum, Differences, Product & Quotients, Chain Rule, Derivatives of Composite Functions, simple integration.	12	30%	CO 3
4	**Central values computation:** arithmetic mean, median, mode, dispersion, standard deviation, co-relation, regression.	10	25%	CO 4

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	40	35	25	-	-	-

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Linearly dependent and independent set, Basis and dimension, Gradient, divergence, and curl, Directional derivative	2
2	Line integration, Green's theorem, Gauss divergence theorem and Stoke's theorem	2
3	Homogenous Linear ODEs with constant coefficient, Euler- Cauchy equations, Wronskian	2
4	Non homogenous ODEs, Method of undetermined coefficient, solution by variation of parameter.	2
5	First order partial differential equation and it's solution Euler's theorem, Total derivatives	2
6	Jacobeans', Maxima and Minima of two variables using Lagrange's multipliers.	2
7	Fourier Series of periodic function	2
8	Fourier integral of cosine and sine function.	2
9	Laplace transform of derivatives and integrals – shifting theorem – differentiation and integration of transforms	2
10	inverse transforms – application of convolution property – solution of linear differential equations with constant coefficients using Laplace transform – Laplace transform of unit step function, impulse function and periodic function	2

Suggested Learning Websites

Sr. No.	Name of Website
1	https://semesters.in/engineering-mathematics-for-btech-first-year/
2	https://www.nptel.ac.in
3	https://tutorial.math.lamar.edu/classes/calci/calci.aspx
4	https://www.khanacademy.com

Reference Books

Sr. No.	Name of Reference Books
1	Erwin Kreyszig, Advanced Engineering mathematics, John Wiley, 10th Ed., 2015.
2	B. S Grewal, Higher Engineering Mathematics, (43rd Edition), Khanna Pub., Delhi (2014).
3	B V Ramana, Higher Engineering Mathematics; McGraw-Hill
4	R. K. Jain and S. R. K. Iyernagar, Advanced Engineering Mathematics, Alpha Science, 3rd Ed., 2007.

Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Science - Information Technology (BSc. IT)
Course Code	:	2BCA01
Course Title	:	Basic Programming with Python
Type of Course	:	Professional Core
Year of Introduction	:	2023-24

Prerequisite	:	-	
Course Objective	:	Learn the fundamentals of python and fluent in the use of control flow statements, in the handling of strings and functions. Understand the methods to create and manipulate python programs by utilizing the data structures like lists, dictionaries, tuples, and sets. Understand the use of operations involving file systems and regular expressions. To Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python along with magic methods.	
Course Outcomes	:	At the end of this course, students will be able to:	
	CO 1	Interpret the fundamental python syntax, semantics and fluent in the use ofpython control flow statements. Express proficiency in the handling of strings and functions.	
	CO 2	Determine the methods to create and manipulate python programs by utilizing the data structures like lists, dictionaries, tuples and sets.	
	CO 3	Identify the commonly used operations involving file systems and regular expressions.	
	CO 4	Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python along with magic methods.	

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
2	0	4	4	70	30	30	20	150

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P** – Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminar s/Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Hrs.	Weightage	Mapping with CO
1.	**Basics of Python:** Using the Python Interpreter, Variables, Identifiers and Keywords, Numbers and Expressions	02	07%	CO 1
2.	**Data Structures: List, Tuples, Dictionaries and Strings:** Common Sequence Operations: Indexing, Slicing, Adding Sequences, Multiplication, Membership, Length, Minimum, and Maximum, Using Lists as Stacks, Using Lists as Queues, List Comprehensions, Nested List Comprehensions, the del statement, Tuples and Sequences, Sets, Dictionaries, Comparing Sequences and Other Types, Basic String Operations	04	13%	CO 1 CO 2
3.	**Control Structures and Functions: Conditional Branching**: if Statements, break and continue Statements, and else Clauses on Loops, pass Statements **Loops:** while Loops, for Loops, Defining Functions, More on Defining Functions: Default Argument Values, Keyword Arguments, Arbitrary Argument Lists, Unpacking Argument Lists, Lambda Expressions, Documentation Strings, Function Annotations	04	13%	CO 1 CO 2
4.	**Modules and Scoping Rules:** Executing modules as scripts, The Module Search Path, "Compiled" Python files, Packages: Importing * From a Package, Intra-package References, Packages in Multiple Directories	02	07%	CO 2 CO 3
5.	**Exception Handling:** Syntax Errors, Exceptions, Handling Exceptions, Raising Exceptions, User-defined Exceptions, Defining Clean-up Actions, Predefined Clean-up Actions	04	13%	CO 2 CO 3
6.	**Magic Methods, Properties and Iterators:** Constructors, Item **Access:** The Basic Sequence and Mapping Protocol, Properties: The property Function, Static Methods and Class Methods, getattr, setattr, and Friends, Iterators, Generators, Generator Expressions	04	13%	CO 3 CO 4
7.	**Object Oriented Programming:** Python Scopes and Namespaces, Class Definition, Class Objects, Instance Objects, Method Objects, Class and Instance Variables, Inheritance, Multiple Inheritance, Private Variables, Polymorphism, Using Properties to Control Attribute Access, Creating Complete Fully Integrated Data Types	06	20%	CO 2 CO 4
8.	**Regular Expression and File Handling:** What is a regular expression? Regular expressions with special	04	14%	CO 3 CO 4

characters, Regular expressions and raw strings, Extracting matched text from strings, Substituting text with regular expressions, Writing and Reading Binary Data, Writing and Parsing Text Files, Iterating

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**30**	**35**	**35**	**-**	**-**	**-**

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Experiment on Lists	02
2	Experiment on Tuples	02
3	Experiment on Dictionaries	02
4	Experiment on Strings	02
5	Experiment on Control Structures and iterators	04
6	Experiment on Functions and magic methods	02
7	Experiment on Modules and scoping rules	02
8	Experiment on Exception handling	04
9	Experiment on Regular expressions	02
10	Experiment on file handling	08

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Python IDLE
2	Anaconda Python
3	PyCharm

Suggested Learning Websites

Sr. No.	Name of Website
1	https://www.python.org/
2	http://www.diveintopython3.net/
3	http://www.diveintopython3.net/
4	https://developer.mozilla.org/en-US/docs/Learn/Server-side/Django
5	https://www.fullstackpython.com/django.html

Textbooks

Sr. No.	Name of Reference Books
1	Magnus Lie Hetland, "Beginning Python From Novice to Professional", ThirdEdition, Apress,2017
2	Magnus Lie Hetland, "Beginning Python From Novice to Professional", Third Edition, Apress,2017
3	Nigel George, "Mastering Django: Core" Packt Publishing, 2016

Reference books

Sr. No.	Name of Reference Books
1	David Beazley, Brian K. Jones, "Python Cookbook", 3rd edition,OREILLY,2016
2	Brett Slatkin, "Effective Python: 59 Specific Ways to Write Better Python",Novatec, 2016
3	Allen Downey, "Think Python: How to Think Like a Computer Scientist",Green Tea Press,2015
4	Mark Lutz "Learning Python", 4th Edition, O'REILLY, 2016
5	Arun Ravindran, Aidas Bendoraitis, Samuel Dauzon, "Django: WebDevelopment with Python",Packt Publishing, 2016

Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Computer Application (BCA)
Course Code	:	2BCA02
Course Title	:	Data Structure
Type of Course	:	Professional Core
Year of Introduction	:	2023-24

Prerequisite	:	Basic of 'c' Programming	
Course Objective	:	To understand rate of change, Difference between Permutation and combination, to understand the geometric representation of any objects which are related,	
Course Outcomes	:	At the end of this course, students will be able to:	
	CO 1	Define and classify various data structures, storage structures and common operations on them	
	CO 2	Create various linear data structures with their representation and perform different operations on them	
	CO 3	Create various nonlinear data structures with their representation and perform different operations on them	
	CO 4	Apply various searching sorting techniques on data set.	

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
2	0	2	3	70	30	30	20	150

Legends: **L**-*Lecture;* **T**–*Tutorial/Teacher Guided Theory Practice;* **P**–*Practical,* **C** – *Credit,* **SEE** – *Semester End Examination,* **CIA** - *Continuous Internal Assessment (It consists of Assignments/Seminars /Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Hrs.	Weightage	Mapping with CO
1	**Introduction to Data Structures:** Algorithms and Flowcharts, Basics Analysis on Algorithm, Complexity of Algorithm, Introduction and Definition of Data Structure, Classification of Data, Various types of Data Structure.	4	20%	CO 1
2	**Linear Data Structure: Array-** Introduction to Arrays, Definition, One Dimensional Array and Multidimensional Arrays, Representation of arrays, Applications of arrays, sparse matrix, and its representation **Stack:** Stack-Definitions & Concepts, Operations On Stacks, Applications of Stacks, Polish Expression, Reverse Polish Expression And Their Compilation, Recursion, Tower of Hanoi **Queue:** Representation Of Queue, Operations On Queue, Circular Queue, Priority Queue, Array representation of Priority Queue, Double Ended Queue, Applications of Queue **Linked List:** Singly Linked List, Doubly Linked list, Circular linked list ,Linked implementation of Stack, Linked implementation of Queue, Applications of linked list	10	25%	CO 2
3	**Nonlinear Data Structure**: **Tree-** Definitions and Concepts, Representation of binary tree, Binary tree traversal (Inorder, postorder, preorder), Threaded binary tree, Binary search trees, Trees To Binary Trees, Applications Of Trees, Some balanced tree mechanism, e.g. AVL trees, 2-3 trees, Height Balanced, Weight Balance, Graph-Matrix Representation Of Graphs, Elementary Graph operations, (Breadth First Search, Depth First Search, Spanning Trees, Shortest path, Minimal spanning tree) **Graphs:** Introduction, Representation to Graphs, Graph Traversals Shortest Path Algorithms.	8	25%	CO 3
4	**Searching, Sorting and Hashing:** **Searching and Sorting-**Searching, Types of Searching, Sorting, Types of sorting like quick sort, bubble sort, merge sort, selection sort. **Hashing:** Hash Function, Types of Hash Functions, Collision, Collision Resolution Technique (CRT), Perfect Hashing	8	30%	CO 4

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**30**	**40**	**30**	**-**	**-**	**-**

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Write a C program that uses functions to perform: **a)** Create a singly linked list of integers. **b)** Delete a given integer from the above linked list. **c)** Display the contents of the above list after deletion	4
2	Write a C program that uses functions to perform: **a)** Create a doubly linked list of integers. **b)** Delete a given integer from the above doubly linked list. **c)** Display the contents of the above list after deletion.	4
3	Write a C program that uses stack operations to convert a given infix expression into its postfix equivalent. Implement the stack using an array.	4
4	Write C programs to implement a double ended queue ADT using: array and doubly linked list respectively.	4
5	Write a C program that uses functions to perform the following: **a)** Create a binary search tree of characters. **b)** Traverse the above Binary search tree recursively in Postorder.	4
6	Write a C program that uses functions to perform the following: **a)** Create a binary search tree of integers. **b)** Traverse the above Binary search tree non recursively in Inorder.	4
7	Write C programs for implementing the following sorting methods to arrange a list of integers in ascending order: **a)** Insertion sort **b)** Merge sort	4
8	Write C programs for implementing the following sorting methods to arrange a list of integers in ascending order: **a)** Quick sort **b)** Selection sort	4
9	Write a C program: **i)** to perform operation Insertion into a B-tree **ii)** for implementing Heap sort algorithm for sorting, a given list of integers in ascending order	4
10	Write a C program to implement all the functions of a dictionary (ADT) using hashing.	4
11	Write a C program for implementing Knuth-Morris- Pratt pattern matching algorithm.	4
12	Write C programs for implementing the following graph traversal algorithms: Depth first traversal & Breadth first traversal	4

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	DEV C++
2	Microsoft C
3	Turbo C

Suggested Learning Websites

Sr. No.	Name of Website
1	https://www.tutorialspoint.com/data_structures_algorithms/data_structures_algorithms_tutorial.pdf

Textbook

Sr. No.	Name of Textbooks
1	Gilberg and Forouzan, "Data Structure- A Pseudo code approach with C" , Thomson publication
2	Tanenbaum, "Data structure in C", PHI / Pearson publication.
3	Pai, "Data Structures & Algorithms; Concepts, Techniques & Algorithms, Tata McGraw Hill

Reference books

Sr. No.	Name of Reference Books
1	Jean-Paul Tremblay & Paul G. Sorenson, An Introduction to Data Structures with Applications, Tata McGraw Hill.
2	Ten Baum, Data Structures using C & C++, Prenctice-Hall International.
3	Horowitz, Sahni, Fundamentals of Computer Algorithms, Galgotia Pub. 2001 ed.

Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Science - Information Technology (BSc. IT)
Course Code	:	2BCA03
Course Title	:	Advance Web Technology
Type of Course	:	Professional Course
Year of Introduction	:	2023-24

Prerequisite	:	Basic of Web Technology
Course Objective	:	The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes
Course Outcomes	:	At the end of this course, students will be able to:
	CO 1	Create small programs using basic PHP concepts.
	CO 2	Apply In-Built and Create User defined functions in PHP programming
	CO 3	Design and develop a Web site using form controls for presenting web based content
	CO 4	Create dynamic Website/ Web based Applications, using PHP, MySQL database

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	**T**	**P**	**C**	**SEE**	**CIA**	**SEE**	**CIA**	
2	0	4	4	70	30	30	20	150

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P** – Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations /MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	**Introduction to PHP:** Identify relationship between Apache, MySQL and PHP ,State steps to Install & test web server ,State Steps to Configure Apache to use PHP, Create simple PHP page using PHP structure and Syntax, List and state use of PHP variables, data types , Describe use of PHP Operators. Apply control structures in Programming, State the steps to create user defined functions, Apply various	9	20%	CO1

	InBuilt Variable, String, MATH, Date, Array, File Functions in programming			
2	**Working Arrays, Forms and with Functions:** What Is an Array?, Creating an Array, Adding , Accessing Array Elements, Creating, Sorting multidimensional array, Transforming Between Strings and Arrays, Creating an Array from a Form. Creating Templates, Using External Files, Using Constants, Working with the Date and Time, Handling HTML, Forms with PHP, Revisited, Making Forms Sticky, Sending Email, Output Buffering, Manipulating HTTP Headers. Creating and Using Simple Functions, Creating and Calling Functions that Take Arguments, Setting Default Argument Values, Understanding Variable Scope	7	20%	CO2
3	**Advanced PHP:** What Are Cookies?, Creating Cookies, Reading from Cookies, Adding Parameters to a Cookie, Deleting a Cookie, What Are Sessions?, Creating a Session, Accessing Session Variables, Deleting a Session. File Permissions, Writing to Files, Locking Files, Reading from Files, Handling File Uploads, Navigating Directories, Creating Directories, Reading Files Incrementally	7	30%	CO3
4	Describe/ State MySQL structure and Syntax, Discuss types of MySQL tables and storage engines, Apply/Use various MySQL commands on database, State steps to connect with database using PHP and MYSQL, Write MySQL commands to Insert, Update, Delete records Describe steps for hosing a Website using 'C' panel and File zilla software	7	30%	CO4

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**30**	**40**	**30**	**-**	**-**	**-**

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	a. Install and configure PHP, web server, and MYSQL b. Write a program to print "Welcome to PHP c. Write a simple PHP program using expressions and operators.	2
2	Write a PHP program to demonstrate the use of Decision-making control structures using- a. If statement b. If-else statement c. Switch statement	2
3	Write a PHP program to demonstrate the use of Looping structures using- a. While statement b. Do-while statement c. For statement d. Foreach statement	2
4	Write a PHP program for creating and manipulating- Indexed array Associative array Multidimensional array	2

5	a. Write a PHP program to-
	  i. Calculate length of string.
	  ii. Count the number of words in string without using string functions.
	b. Write a simple PHP program to demonstrate use of various built-in string functions.
		2

6	Write a simple PHP program to demonstrate use of simple function and parameterized function.	2
7	Write a simple PHP program to create PDF document buy using graphics concepts	2
8	Design a web page using following form controls: a. Text box, b. Radio button, c. Check box, d. Buttons List box, e. Combo box, f. Hidden field box	2
9	Write simple PHP program to - a. Set cookies and read it. b. Demonstrate session management	4
10	Develop web page with data validation.	2

	a. Form validation is required to prevent web form abuse by malicious users. Improper validation of form data is one of the main causes of security vulnerabilities. It exposes your website to attacks such as header injections, cross-site scripting, and SQL injections. **b.** header injection attacks can be used to send email spam from your web server. **c.** cross-site scripting may allow an attacker to post any data to your site. **d.** SQL injection may corrupt your database backend	
11	Develop a simple application to - **a.** Enter data into database. **b.** Retrieve and present data from database	2
12	Develop a simple application to Update, Delete table data from database. PHP MySQL Update Query	2

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Web browser
2	Notepad / Sublime text / Visual studio code

Suggested Learning Websites

Sr. No.	Name of Website
1	https:// www.w3schools.com/
2	https:// www.tutorialspoint.com/

Textbooks

Sr. No.	Name of Textbooks
1	Steven Holzner, PHP: The Complete Reference, McGraw-Hill,2008
2	Robin Nixon , Learning PHP, MySQL JavaScript, CSS & HTML5, Third Edition O'Reilly Media , 2014

Reference Books

Sr. No.	Name of Reference Books
1	Black Book, HTML 5, Dreamtech Press
2	Black Book, Web Technologies, Dreamtech Press
3	Ralph Moseley and M. T. Savaliya, Developing Web Applications, Wiley-India
4	Cody Lindley, jQuery Cookbook, O'Reilly Media
5	Ryan Benedetti, Ronan Cranley, Head First jQuery - A Brain-Friendly Guide, O'Reilly Media

Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Science - Information Technology (BSc. IT)
Course Code	:	2BCA04
Course Title	:	Object Oriented Principles with Programming Methods
Type of Course	:	Professional Core
Year of Introduction	:	2023-24

Prerequisite	:	-
Course Objective	:	Learn various of Programming Methodologies and Approach, Understanding the problem, identifying the solution, applying techniques for solution. Represent solution by the algorithm, flowchart. Writing the program. Learn debugging for correctness, Understand Object Oriented paradigm, and it's Principals, Learn Modelling Language -UML
Course Outcomes	:	At the end of this course, students will be able to:
	CO 1	Define and classify various Programming Methodologies and Approach
	CO 2	Learning to identifying the problem, and it's solution, applying techniques for solution
	CO 3	Draw solution by the algorithm, flowchart. Writing the program.
	CO 4	Learn the Programming Construct, Writing the program. Learn debugging for correctness,
	CO 5	Know the Object, Object Oriented (OO) paradigm and Object elements, OO Principals, Learn Modelling Language -UML

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total
L	T	P	C	SEE	CIA	SEE	CIA	Marks
2	2	0	3	70	30	30	20	150

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P**–Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations /MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	**Introduction:** Types of Programming Methodologies, Top-down or Modular Approach, Bottom-up Approach **Understanding the problem:** Requirement Gathering, Problem Definition **Identifying the solution:** Flowcharting, Data Flow Diagram, Pseudocode, Identifying Mathematical Operations **Applying modular techniques:** Advantages of Modular Programming, Identifying the Modules, Step-by-Step Solution, Control Structures **Writing the algorithm** **Flowchart**: Know flowchart elements, Draw Flowcharts. **Using clear instructions:** Clarity of Expressions Simplicity of Instructions.	10	20%	CO 1 CO 2
2	**Correct programming techniques:** Proper Identifier, Names, Comments, Indentation **Debugging:** Syntax Errors, Semantic Errors, Runtime Errors, Code Optimization, Execution Time Optimization, Memory Optimization. **Program documentation:** Advantages of Documentation, Example Documents **Program maintenance:** Types of Maintenance, Maintenance Tools.	4	20%	CO 3
3	**Introduction OO paradigm:** Paradigms of Programming Languages, Evolution of OO Methodology, Basic Concepts of OO Approach, Comparison of Object Oriented and Procedure Oriented Approaches, Benefits of OOPs	6	20%	CO 4
4	**Basic Object Oriented Principals:** Encapsulation, Data hiding, polymorphism, Inheritance, Abstraction. Introduction to Common OO Language	6	30%	CO 4 CO 5
5	**Introduction to UML:** Various UML Diagrams	4	10%	CO 5

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**30**	**30**	**20**	**20**	**-**	**-**

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Compare various types of Programming Methodologies,	2
2	State advantages of Modular Approach, Top-down, Bottom-up Approaches.	2
3	Do the Requirement Gathering, and define Problem Definition of application ADDRESS BOOK,	4
4	Write the algorithm of application ADDRESS BOOK	4
5	Write the Flow chart of application ADDRESS BOOK	4
6	Write the steps for Debugging a program.	4
7	Define the object ADDRESS Entity and Explain Encapsulation, Data hiding, polymorphism, Inheritance, Abstraction in ADDRESS Entity.	6
8	Define and explain Various UML Diagrams of object ADDRESS	4

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	UML Tools - Visual Paradigm, VISIO, STARUML

Suggested Learning Websites

Sr. No.	Name of Website
1	https://www.tutorialspoint.com/programming_methodologies/programming_methodologies_tutorial.pdf
2	http://www.cectl.ac.in/images/pdf_docs/studymaterial/cse/s3/ds1.pdf

Reference books:

Sr. No.	Name of Reference Books
1	Venit, S & Drake E., Prelude to Programming: Concepts & Design, 4th Ed., Addison Wesley (Pearson)
2	Matt Weisfeld, The Object Orient Thought Process,3rd Ed., Addison Wesley

Name of Faculty	:	Faculty of Engineering & Technology
Name of Program	:	Bachelor of Science - Information Technology (BSc. IT)
Course Code	:	2BAC01
Course Title	:	Advance Communication Skills
Type of Course	:	Ability Enhancement (AE)
Year of Introduction	:	2023-24

Prerequisite	:	-
Course Objective	:	Understand of the fundamental elements of communication in English language. Know and understand different practices of verbal and non-verbal communication with inputs to improve basic language skills. To strengthen the communication skills of professionals to make them ready for the modern workplace. To fine tune their professional skills and expertise using communication skills. To participate in the life-long learning process with confidence and certainty. To understand communication and its process and effect on giving and receiving information. To learn and apply communication skills in different public and interpersonal contexts. To develop analytical, research, and organizational skills through communication skills for a fulfilling career.
Course Outcomes	:	At the end of this course, students will be able to:
	CO1	Students will improve their writing skills by identifying and correcting common errors in sentence structure, punctuation, subject-verb agreement, and noun-pronoun agreement.
	CO2	Students will develop effective communication skills, including understanding the process, types, and levels of communication, as well as verbal and non-verbal communication, leading to better interactions and overcoming communication barriers.
	CO3	Students will develop strong reading and listening skills, allowing them to comprehend and engage with various texts and audio materials effectively, demonstrating improved comprehension, critical thinking, and communication abilities.
	CO4	Students will refine their technical writing skills through sessions on note writing, memo writing, report writing, email and letter writing etiquette, enabling them to communicate effectively in various professional contexts using appropriate grammar.
	CO5	Students will develop essential skills in goal setting, habit formation, teamwork, presentations, and critical analysis of films, improving their communication, critical thinking, collaboration

	and self-improvement abilities for success in academic and professional contexts.	

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
2	0	0	2	70	30	0	0	100

Legends: L-Lecture; T–Tutorial/Teacher Guided Theory Practice; P – Practical, C – Credit, SEE – Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.))

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with COs
1	Structure of English Language Academic, Research and Technical Vocabulary Phonetics and Accent Communication Skills: Process, Types and Levels of communication. Technical communication and general communication. Factors to be considered in technical communication. Verbal and Non-Verbal communication (Kinesics): Components of non-verbal communication. Barriers to effective communication. Communication across culture.	07	25%	CO1
2	Listening Skills, Note Taking and Note Making Collective note-taking and note-making on digital platforms, Types of Listening. Barriers in Effective Listening. Tips for effective listening. Barriers to effective communication	6	15%	CO2
3	Reading Comprehension, Speed Reading, Emails, creating e-content, Editing and proofreading online, using grammar and spell check software,	5	10%	CO3
4	The art of introducing oneself public speaking and articulation, Interview Skills: Introduction. General preparation for an interview. Types of questions generally asked in interview. Types of interviews. Importance of non-verbal aspects in an interview, Group Discussion (Abstract, Dialogues, Role play, Script, Minutes of meeting Report Writing, Creating Lab Journals and Manuals, Technical Proposals Regret and Adjustment Definition of technical proposal, Portfolio of Critical Writing and Creative Writing,	7	25%	CO4

	Essay, Story-writing, etc. Summarizing, Writing Reviews, (Books/ Articles/ Movies/websites), Reading Skills (Advanced)			
5	Letter Writing, and Job Applications: Business Letters, Structures and Types of Business Letters: Letters of Enquiry, Complaint, Claim, Adjustment, Sales, Cover letters, Placing Orders, Purpose, Types, Characteristics, Structure, Style and Appearance. Essential Parts of Application. Cover Letter and the Resume. Types of Resumes. Chronological Resume, Functional Resume Writing,	7	25%	CO5

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**15**	**15**	**20**	**15**	**15**	**20**

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours	Mapping with CO
1	**Worksheets on Identifying Common Errors in Writing:** • Sentence structure • Punctuations • Subject-Verb Agreement Noun-Pronoun Agreement	02	CO1
2	**Communication Skills:** Process, Types and Levels of communication. Technical communication and general communication. Factors to be considered in technical communication. Verbal and Non-Verbal communication (Kinesics): Components of non-verbal communication. Barriers to effective communication.	01	CO2
3	**Reading Comprehension:** To enable the students, develop the knowledge, skills, and strategies they must possess to become proficient and independent readers. **Listening Skills worksheet:** Students are supposed to solve worksheets provided to them in the classroom with the help of audio clips they listen.	02	CO3
4	**Reporter:** An activity class where the scene of a press conference is created in the class.	02	CO5

	Students are encouraged to ask sharp questions and in turn are invited to assume roles of famous personalities, thus answering the questions posed.		
5	**Note Writing:** This session will enhance the technical writing skills in students. **Memo Writing:** This session will enhance the technical writing skills in students.	01	CO4
6	**Writing Reports** - Process of writing - Order of writing Final draft & checklist for reports	02	CO4
7	**Technical Writing:** Email etiquette & Email writing Letter Writing: - Trains students on detailed email and letter writing etiquette. - Students will be able to write formal letters following certain stipulated formats. - They will learn different types of letters for different official purposes. **Appreciation, Apology and Acknowledgement letters:** - To enable the students to maintain productive business relationship through different types of letters. To enable the students to express their feelings without speaking out loud.	02	CO1 CO4
8	**Paragraph Development** - Structure of Paragraph - Construction of Paragraph - Using transitions and connecting Devices Para jumble worksheets	02	CO4
9	**Adjectives and Adverbs:** Learn the types of Adjectives and Adverbs, importance of using these words in day-to-day life and learn to use them in writing E-mails **Conjunctions and Interjections**	02	CO1 CO4
10	**Classification of sentences and Punctuations:** To provide knowledge of different types of sentences and their usages in day-to-day communication. To get knowledge of transforming sentences.	02	CO4
11	**Goal setting & Tracking:** To enable the students to define strategies or implementation steps to attain the identified goals and make progress every day.	02	CO5
12	**Habit formation:** The students will be given a detailed study about the formation of habits and its effects. They will also be taught different techniques to cultivate good habits that will help them to refine themselves. **Team building:** This session is dedicated to make the students understand the	02	CO5

	importance of Teamwork and how to work as a team. It involves activities that will help the students break the ice amongst them and to work productively as a team.		
13	**Professional Presentations** • Combating stage fright • Preparing power point presentation • Delivering PPT	04	CO5
14	**Movie Review:** • Analyzing and evaluating the elements of a film, such as plot, character, dialogue, cinematography, and sound • Learning how to write a well-structured and engaging movie review. • Understanding the importance of context and perspective in film criticism Practicing communication skills by presenting and discussing movie reviews in class.	02	CO5

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Language lab (with computers)
2	Software Wordworth

Suggested Learning Websites

Sr. No.	Name of Website
1	http://www.readanybook.com/general/literature-15
2	http://www.readcentral.com/general/communication
3	http://www.pagebypagebools.com/title.html
4	http://www.read.gov/books
5	http://www.readbookline.net/prize/nobel-3/puliyzer-2
6	http://www.grammerbank.com
7	http://www.readtheory.org/
8	http://www.ielts-useful-tips.com/reading-exercise.html
9	http://www.learnenglishlisteeens,britishcouncil,org/skills/reading-skills-practice
10	http://www.learninglishteenstore.net/
11	http://www.bbc.co.uk/woldservice/learningenglish/general/

Reference Books

Sr. No.	Name of Reference Books
1	Maley, A. 'Literature in the Language Classroom', The Cambridge Guide to Teaching ESOL, Cambridge University Press, 2001.
2	Richards, Jack C., and Willy A. Renandya, eds. Methodology in Language Teaching: An Anthology of Current Practice. Cambridge University Press, 2002.
3	Kaul, Asha. Business Communication. Delhi: Prentice-Hall of India, 2006.

4	Harmer, Jeremy. The Practice of English Language Teaching. Harlow: Pearson Longman, 2007.
5	Meenakshi Raman & Sharma, Technical Communication Principles and Practice by Oxford University Press, New Delhi.
6	Basic Communication Skills for Technology, Andrea J. Rutherford (Pearson Education)
7	Communication Skills for Engineers, Sunita Mishra, C. Murali Krishna (Pearson Education)
8	Business Communication Strategies. Matthukutty M. Monipally (Tata-McGraw-Hills)

Name of Faculty	:	Faculty of Engineering & Technology
Name of Program	:	Bachelor of Science - Information Technology (BSc. IT)
Course Code	:	1BES01
Course Title	:	Environmental Science & Sustainable Development
Type of Course	:	Value Added (VA)
Year of Introduction	:	2023-24

Prerequisite	:	A keen interest in the natural systems that support life on earth	
Course Objective	:	To promote environmental principles that result in pro-conservation behaviour.	
Course Outcomes	:	At the end of this course, students will be able to:	
	CO1	Explain multi-disciplinary nature of environment, its component and degradation	
	CO2	Identify the types of pollution in society along with their sources	
	CO3	Realize the global environmental issues	
	CO4	Implement the concept of recycle and reuse in all fields of engineering	
	CO5	Understand sustainability and identify major sustainability challenges	

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
3	0	0	3	70	30	0	0	100

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P** – Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	**Concept of Environmental Science:** Definition, Principles & Scope of environmental science. Structure and composition of atmosphere- troposphere, stratosphere, mesosphere and thermosphere; Hydrosphere, lithosphere-horizon, nutrients in soil, nitrogen pathways and biosphere	10	16%	CO1
2	**Environmental Pollution:** Types of Environmental Pollution:	18	50%	CO1 CO2 CO3

	Water Pollution: Introduction to Water Quality Standards, Sources of Water Pollution: Industrial, Agricultural, Municipal; Classification of water pollutants, Effects of water pollutants, Eutrophication Marine pollution Air Pollution: Composition of air, Structure of atmosphere, Ambient Air Quality Standards, Classification of air pollutants, Sources of common air pollutants like PM, SO2, NOX, Natural & Anthropogenic Sources, Effects of common air pollutants Land Pollution: Land uses, Land degradation: Causes, Effects and Control, Soil Erosion Noise Pollution: Introduction, Sound and Noise, Noise measurements, Causes and Effects Thermal Pollution: Causes and effects, Role of individual in the prevention of pollution			
3	**Global Environment Issues:** Global Environmental problems: Ozone layer depletion, sea level rise, Acid rain, global warming, Forest fire, Global Warming and Green House Effect.	10	17%	CO3
4	**Concept of 4R's:** Principles, Application of 4R's	02	7%	CO4
5	**Sustainable Development:** Meaning, Definition, Goals, Achieving Sustainable Development.	05	10%	CO5

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**40**	**40**	**20**	**0**	**0**	**0**

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested Learning Websites

Sr. No.	Name of Website
1	https://moef.gov.in/en/
2	https://nptel.ac.in/

Reference Books

Sr. No.	Name of Reference Books
1	Basics of Environmental Studies by Prof Dr N S Varandani, LAP -Lambert Academic Publishing, Germany.
2	Environmental Studies by R. Rajagopalan, Oxford University Press.
3	Environmental Studies by Dr. Suresh K Dhameja, S K Kataria & Sons New Delhi.
4	Basics of Environmental Studies by U K Khare, Tata McGraw Hill.
5	Environmental Studies by Anindita Basak ,2009 Publisher: Drling Kindersley (India)Pvt. Ltd. Pearson.
6	Textbook of Environmental Studies by Deeksha Dave & S S Kateva, Cengage Publishers.
7	Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha. Secondedition,2013 Publisher: Universities Press (India) Private Ltd, Hyderabad.
8	Environmental Studies by Benny Joseph, TMH publishers.