Academic Council 10/04/2024
Item No: 5.18

Parle Tilak Vidyalaya Association's

MULUND COLLEGE OF COMMERCE (AUTONOMOUS)

॥ आ नो भद्राः क्रतवो यन्तु विश्वतः ॥

Syllabus for F.Y. B.Sc.(CA)

Programme: Bachelor of Science (Computer Applications)

Code:

BASED ON LEARNING OUTCOME CURRICULUM FRAMEWORK (LOCF) and NEP

Semester I & II

with effect from the academic year

2025 – 2026

AC:**10/04/2024**
Item No: **5.18**

Parle Tilak Vidyalaya Association's
MULUND COLLEGE OF COMMERCE (AUTONOMOUS)

Sr. No.	Heading	Particulars
1.	Title of the Course	**Bachelor of Science (Computer Applications)**
2.	Eligibility for Admission	Any student who has completed HSC or equivalent in Arts / Science / Commerce / MCVC with Mathematics or Statistics as one of the subjects. Any student who has completed Diploma in IT / CS/ Electrical / Electronics / Mechanical / Civil / Electronics and Telecommunication / Instrumentation and allied branches from MSBTE or equivalent board. Any student who has completed HSC or equivalent in Arts / Science / Commerce / MCVC without Mathematics or Statistics will have to undergo a bridge course of 30 hours on Mathematics and Statistics.
3.	Passing Marks	40%
4.	Ordinances / Regulations (if, any)	As applicable for all B.Sc. Courses
5.	Number of years / Semesters	Three years – Six Semesters / Four years – Eight Semesters
6.	Level	~~P.G.~~ / U.G. /~~Diploma / Certificate~~
7.	Pattern	Semester, Choice Based Credit system under NEP
8.	Status	New / ~~Revised~~
9.	To be implemented from Academic year	From the Academic Year **2025 – 2026**

Date: 10-04-2024 **Signature:**_____

Name of the BoS Chairperson **Dr. Hiren Dand**

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F. Y. B.Sc. C.A. Syllabus 2025 - 2026

Semester – I			
Course Code	**Course Type**	**Course Title**	**Credits**
MCCSCT106	Major	Fundamentals of Computers	**4**
MCCSCT103	Major	Imperative Programming	**4**
MCCSCT111	Major	Web Technologies	**4**
MCCMATH101	Minor	Basic Mathematics	**2**
MCCSB112	GE / OE (Choose any one)	Essentials of Management	**2**
MCCSB113		Group Dynamics and Leadership Skills	
MCCENG108	AEC	Enhancing Soft Skills	**2**
MCCSCTEVS101	VEC	Green Computing	**4**
		Total Credits	**22**

GE / OE: General Elective / Open Elective

AEC: Ability Enhancement Course

VEC: Value Education Course

IKS: Indian Knowledge System

Contents

Preamble

The B.Sc. Computer Applications programme focuses on computer fundamentals, programming in languages such as C, C++, Python and Java, database management, internet technologies, operating system concepts, and more.
The curriculum offers a balanced approach to software development, and the courses cover a wide range of topics ranging from design principles to software security. Throughout the programme, students develop practical skills and apply their knowledge in hands-on projects.
This programme enables students to create a strong foundation of computing concepts and gets them ready to develop computer applications and website for organisations.

Objectives:

- Provide strong foundations in fundamentals of Computer Science and applications, inter disciplinary courses and electives for widening the domain expertise.
- Design and develop software based solutions for real world problems, serving effectively to the requirements of computer field and Society

- Attain sufficient knowledge related to computer domains, possesses technical, soft and hard skills and apply them effectively in team work
- Empower the students with competencies in creative thinking and problem solving, inter-personal communication and managerial skills

Programme Specific Outcomes:

PSO1: Understanding of the key concepts and principles of programming languages.

PSO2: Capacity to analyze a problem, identify the computing requirements and using Procedures find a solution.

PSO3: Development of practical skills to solve problems and provide solutions using current trends in the discipline of Computer Applications.

PSO4: Ability to apply the algorithmic principles, mathematical foundations and computer science theory for designing computer-based systems

SEMESTER I

MCCSCT106 Fundamentals of Computers

Bachelor of Science (Computer Applications)		**Semester – I**		
Course Name: Fundamentals of Computers		**Course Code: MCCSCT106**		
Vertical:		**Major**		
Periods per week (1 Period is 60 minutes)		**3**		
Practical per week (1 Period is 60 minutes)		**2**		
Credits		**4**		
Evaluation System		**Duration (in Hours)**	**Total Marks**	**Minimum Passing Marks**
Theory	**Continuous Internal Assessment**	**--**	**40**	**16**
	End Semester Examination	**2**	**60**	**24**
Practical	**Continuous Internal Assessment**	**--**	**20**	**8**
	End Semester Examination	**2**	**30**	**12**

Objectives of the Course:

1. To introduce students to the fundamental concepts of computers, including algorithms, characteristics, and the stored program concept, enabling them to understand the workings of a computer system and its components.
2. To familiarize students with various numbering systems used in digital computing and provide them with the knowledge to convert between different number systems and other concepts of weighted, non-weighted, alphanumeric, error detection and correction code and provide them with the knowledge to convert between different codes and to develop students' proficiency in binary arithmetic and negative number representation, and enable them to perform arithmetic operations like addition, subtraction, multiplication, and division in binary, octal, and hexadecimal number systems.
3. To introduce students to Boolean algebra and logic gates, enabling them to simplify logic expressions using Boolean theorems and laws, design logic circuits, and implement different logic functions using universal gates.

4. To provide students with a comprehensive understanding of combinational logic circuits, including multi-input, multi-output circuits, and enable them to design and implement code converters effectively.
5. To introduce students to arithmetic circuits such as adders, BCD adders, Excess-3 adders, binary subtractors, BCD subtractors, multipliers, and comparators, and enable them to analyse, design, and implement these circuits for various applications.

Module	Name	Lectures
I	**Computer Science Fundamentals and Technology Overview**	**09**
II	**Number Systems and Arithmetic Operations**	**09**
III	**Boolean Algebra and Logic Fundamentals**	**09**
IV	**Basic Combinational Logic Circuits**	**09**
V	**More Combinational Logic Circuits**	**09**
	Total	**45**

R- Remember, U- Understand, A – Apply, AN- Analyze, EV- Evaluate, CR – Create

Module /Unit	Syllabus	Level of Knowledge Applicable as per Blooms Taxonomy
I	**<u>Computer Science Fundamentals and Technology Overview</u>** **A) Computer Basics:** Algorithms, Simple Model of a Computer, Characteristics of Computers, Problem Solving Using Computers, Flowchart, Program, Working of a Computer, Stored Program Concept, Hardware and Software. **B) Input/Output Units:** Traditional Computer Input/Output Units, Other Input Technologies, Computer Output Devices, Choosing a printer. **C) Computer Memory:** Memory Cell, Memory Organization, Read Only Memory, Serial Access Memory, Physical Devices Used to Construct Memories, Magnetic Hard Disk, Compact Disk Read Only Memory (CDROM), Magnetic Tape Drive, Memory Hierarchy.	**A) U** **B) U, R** **C) U**

II	**Number System and Arithmetic Operations:** **A) Number System:** Analog System, digital system, numbering system, binary number system, decimal number system, octal number system, hexadecimal number system, conversion from one number system to another, floating point numbers, weighted codes binary coded decimal, non-weighted codes Excess – 3 code, Gray code, Alphanumeric codes – ASCII Code, EBCDIC, ISCII Code, Hollerith Code, Morse Code, Teletypewriter (TTY), Error detection and correction, Universal Product Code, Code conversion. **B) Binary Arithmetic:** Binary addition, Binary subtraction, Negative number representation, Subtraction using 1's complement and 2's complement, Binary multiplication and division, Arithmetic in octal number system, Arithmetic in hexadecimal number system, BCD and Excess – 3 arithmetic.	**A) U** **B) U, AN**
III	**Boolean Algebra and Logic Fundamentals:** **A) Boolean Algebra and Logic Gates:** Introduction, Logic (AND OR NOT), Boolean theorems, Boolean Laws, De Morgan's Theorem, Perfect Induction, Reduction of Logic expression using Boolean Algebra, Deriving Boolean expression from given circuit, exclusive OR and Exclusive NOR gates, Universal Logic gates, Implementation of other gates using universal gates, Input bubbled logic, Assertion level. **B) Minterm, Maxterm and Karnaugh Maps:** Introduction, minterms and sum of minterm form, maxterm and Product of maxterm form, Reduction technique using Karnaugh maps – 2/3/4/5/6 variable K-maps, Grouping of variables in K-maps, K-maps for product of sum form, minimize Boolean expression using K-map and obtain K-map from Boolean expression, Quine Mc Cluskey Method.	**A) A, EV** **B) U, A**
IV	**Basic Combinational Logic Circuits:** **A) Combinational Logic Circuits:** Introduction, Multi-input, multi-output Combinational circuits, Code converters design and implementations.	**A) U**
V	**More Combinational Logic Circuits:** **A) Arithmetic Circuits:** Introduction, Adder, BCD Adder, Excess – 3 Adder, Binary Subtractors, BCD Subtractor, Multiplier, Comparator. **B) Multiplexer, Demultiplexer, ALU, Encoder and Decoder:** Introduction, Multiplexer, Demultiplexer, Decoder, ALU, Encoders.	**A) R, CR** **B) U, R**

Fundamentals of Computer - Practical

List of Practical:		Level of Knowledge Applicable as per Blooms Taxonomy
1.	**Study of Logic gates and their ICs.**	**U**
a.	Study of NOT, AND, OR, NAND, NOR, XOR and XNOR gates.	
b.	IC 7404, 7408, 7432, 7400, 7402, 7486 AND 74266.	
2.	**Implement Universality of NAND and NOR gate.**	**U, R**
a.	Implement NOT, AND, OR, NOR, XOR and XNOR gate using NAND gate.	
b.	Implement NOT, AND, OR, NAND, XOR and XNOR gate using NOR gate.	
3.	**Implement the given Boolean expressions and simple combinational circuits using minimum number of gates.**	**A**
a.	Verifying De Morgan's laws.	
b.	Implement SOP expressions using minimum number of gates.	
c.	Implement POS expressions using minimum number of gates.	
d.	Design and implement combinational circuit based on the problem given and minimizing using K-maps.	
4.	**Design and Implement Code Converters**	**A, CR**
a.	Design and implement Binary to Gray code converter.	
b.	Design and implement Gray to Binary code converter.	
c.	Design and implement BCD to Gray code converter.	
d.	Design and implement Binary to XS-3 code converter.	
e.	Design and implement Binary to BCD code converter.	
5.	**Design and Implement Arithmetic circuits**	**A**
a.	Design and implement Half adder.	
b.	Design and implement Full adder.	
c.	Design and implement BCD adder.	
d.	Design and implement XS – 3 adder.	
e.	Design and implement Half subtractor.	
f.	Design and implement Full subtractor.	
g.	Design and implement BCD subtractor.	
h.	Design and implement XS – 3 subtractor.	
i.	Design and implement a 2-bit by 2-bit multiplier.	
j.	Design and implement comparator circuit	
6.	**Design and implement Multiplexer and Demultiplexer Circuits**	**A, CR**
a.	Study of 4:1 Multiplexer IC	

b.	Study of 8:1 Multiplexer IC	
c.	Design and implement 4:1 Multiplexer using logic gates.	
d.	Design and implement 8:1 Multiplexer using logic gates.	
e.	Study of 1:4 Demultiplexer IC	
f.	Study of 1:8 Demultiplexer IC	
g.	Design and implement 1:4 Demultiplexer using logic gates.	
h.	Design and implement 1:8 Demultiplexer using logic gates.	
i.	Design and implement 3:8 decoder using logic gates.	
j.	Design and implement 8:3 encoder using logic gates.	
7.	**Design and implement Encoder and Decoder Circuits**	**U, R**
a.	Study of 4:2 Encoder IC	
b.	Study of 8:3 Encoder IC	
c.	Study of 2:4 Decoder IC	
d.	Study of 3:8 Decoder IC	
e.	Design and implement 2:4 Decoder using logic gates.	
f.	Design and implement 3:8 Decoder using logic gates.	
8.	**Design and Implement flip-flops**	**CR**
a.	Design and implement SR Flip-flop	
b.	Design and implement D Flip-flop	
c.	Design and implement JK Flip-flop	
d.	Design and implement T Flip-flop	
9.	**Design and Implement Counter**	**CR**
a.	Design and Implement 2-bit Counter	
b.	Design and Implement 4-bit Counter	
10.	**Design of shift registers**	**CR**
a.	Design and implement serial – in serial – out register.	
b.	Design and implement serial – in parallel – out register.	
c.	Design and implement parallel – in serial – out register.	
d.	Design and implement parallel – in parallel – out register.	

Learning Outcomes: After completion of Course, the learners will be able to:

1. Describe the characteristics of computers and their basic functioning, including algorithms and the stored program concept. (Knowledge)
2. Demonstrate the ability to convert numbers between various number systems, including binary, octal, and hexadecimal and Apply binary arithmetic techniques to perform addition, subtraction, multiplication, and division, and represent negative numbers using 1's complement and 2's complement. (Application)
3. Analyze and simplify logic expressions using Boolean theorems, laws, and De Morgan's theorem, and design logic circuits based on given logic functions. (Analysis)

4. Create and assemble arithmetic circuits like adders, BCD adders, Excess-3 adders, binary subtractors, BCD subtractors, multipliers, and comparators, showcasing the ability to build efficient circuits for arithmetic operations. (Synthesis)
5. Assess the functionality and effectiveness of the designed digital circuits, and justify the selection of specific components and configurations based on the desired applications and performance requirements. (Evaluation)

Books and References:

1. Palan, N. G. (n.d.). Digital electronics and logic design. Technova.
2. Rajaraman, V., & Adabala, N. (2015). Fundamentals of computers (6th ed.). PHI Learning Private Limited.
3. Platt, C. (2010). Make electronics (1st ed.). O'Reilly.
4. Jain, R. P. (n.d.). Modern digital electronics (3rd ed.). Tata McGraw Hill.
5. Malvino, A. P., & Leach, D. P. (n.d.). Digital principles and applications. Tata McGraw Hill.
6. Maini, A. K. (2007). Digital electronics: Principles, devices and applications. Wiley.

Percentage of 6 categories of Blooms Taxonomy in question paper

	Remember	Understand	Apply	Analyze	Evaluate	Create	
% in Question Paper	**20**	**20**	**20**	**10**	**10**	**20**	**100%**

MCCSCT103 Imperative Programming

B.Sc. (Computer Applications)	**Semester – I**

Course Name: Imperative Programming		Course Code: MCCSCT103		
Vertical:		Major		
Periods per week (1 Period is 60 minutes)		3		
Practical per week (1 Period is 60 minutes)		2		
Credits		4		
Evaluation System		Duration (in Hours)	Total Marks	Minimum Passing Marks
Theory	Continuous Internal Assessment	--	40	16
	End Semester Examination	2	60	24
Practical	Continuous Internal Assessment	--	20	8
	End Semester Examination	2	30	12

Course Objectives

1. To equip students with a comprehensive understanding of the essential elements of the C programming language, including variable declarations, data types, arithmetic expressions, and input/output methods, enabling them to write and execute basic C programs in both interactive and batch modes.
2. To introduce students to top-down design principles using functions and structure charts, and familiarize them with library functions, empowering them to build modular, well-organized C programs by effectively using existing information and handling common programming errors.
3. To enable students to master the concepts of repetition and loop statements in C programming, including counting loops with the while and for statements, conditional loops, nested loops, and flag-controlled loops, allowing them to effectively use iterative techniques to solve various programming problems and implement loops in graphics programs.
4. To provide students with a comprehensive understanding of pointers and modular programming in C, covering topics such as pointers and the indirection operator, functions with output parameters, formal output parameters as actual arguments, and scope of names, allowing them to create efficient and modular programs while understanding the importance of debugging and testing to minimize common programming errors.
5. To provide students with a solid understanding of strings in C programming, covering string basics, library functions for string manipulation (assignment and substrings), concatenation, and string comparison, enabling them to handle longer strings and perform conversions between strings and numbers efficiently, while avoiding common programming errors related to string handling and To introduce students to the concept of Structure and union, recursion in programming, including the nature of recursion and tracing recursive functions, and enable them to implement recursive mathematical functions, recursive functions with array and string parameters, and solve problems using recursion, while gaining insights into common programming errors associated with recursive techniques.

Module	Name	Lectures
1	**C Programming Basics and Design**	**9**
2	**Control Flow and Looping Structures in C**	**9**
3	**Pointers, Arrays, and Modular Programming**	**9**
4	**Strings and Recursion in C**	**9**
5	**Structures and Unions in C**	**9**
	Total	**45**

R- Remember, U- Understand, A – Apply, AN- Analyze, EV- Evaluate, CR - Create

Unit	Details	Level of Knowledge Applicable as per Blooms Taxonomy
I	**C Programming Basics and Design:** **A) C Language Elements:** Variable Declarations and Data Types, Executable Statements, General Form of a C Program, Arithmetic Expressions, Formatting Numbers in Program Output, Interactive Mode, Batch Mode, and Data Files, Common Programming Errors. **B) Top-Down Design with Functions:** Building Programs from Existing Information, Library Functions, Top-Down Design and Structure Charts, Functions without Arguments, Functions with Input Arguments, Introduction to Computer Graphics, Common Programming Errors	**A) U, AN** **B) R, U**
II	**Control Flow and Looping Structures in C:** **A) Selection Structures: if and switch Statements:** Control Structures, Conditions, The if Statement, if Statements with Compound Statements, Decision Steps in Algorithms, More Problem Solving, Nested if Statements and Multiple-Alternative Decisions, The switch Statement, Common Programming Errors. **B) Repetition and Loop Statements:** Repetition in Programs, Counting Loops and the while Statement, Computing a Sum or a Product in a Loop, The for Statement, Conditional Loops, Loop Design, Nested Loops, The do-while Statement and Flag-Controlled Loops, Iterative Approximations, How to Debug and Test Programs, Loops in Graphics Programs, Common Programming Errors.	**A)U, A, AN** **B) U, A, AN**

III	**Pointers, Arrays, and Modular Programming:** **A) Pointers and Modular Programming:** Pointers and the indirection Operator, Functions with Output Parameters, Multiple Calls to a Function with Input/Output Parameters, Scope of Names, Formal Output Parameters as Actual Arguments, Debugging and Testing a Program System, Common Programming Errors. **B) Arrays:** Declaring and Referencing Arrays, Array Subscripts, Using for Loops for Sequential Access, Using Array Elements as function Arguments, Array Arguments, Searching and Sorting an Array, Parallel Arrays and Enumerated Types, Multidimensional Arrays, Graphics Programs with Arrays, Common Programming Errors	**A) R, U** **B) U, AN**
IV	**Strings and Recursion in C:** **A) Strings:** String Basics, String Library Functions: Assignment and Substrings, Longer Strings: Concatenation and Whole-Line Input, String Comparison, Arrays of Pointers, Character Operations, String-to-Number and Number-to-String Conversions, Common Programming Errors B) **Recursion:** The Nature of Recursion, tracing a Recursive Function, Recursive Mathematical Functions, Recursive Functions with Array and String Parameters, Problem Solving with Recursion, Common Programming Errors	**A) R, U** **B) U, AN**
V	**Structures and Unions in C:** **A) Structure and Union Types:** User-Defined Structure Types, Structure Type Data as Input and Output Parameters, Functions Whose Result Values Are Structured, Problem Solving with Structure Types, Parallel Arrays and Arrays of Structures, Union Types, Common Programming Errors	**A) U, A, AN**

List of Practical:	**Level of Knowledge Applicable as per Blooms Taxonomy**

1.	**Basic Programs:**	**U, A**
a.	Write a program to display the message HELLO WORLD.	
b.	Write a program to declare some variables of type int, float and double. Assign some values to these variables and display these values.	
c.	Write a program to find the addition, subtraction, multiplication and division of two numbers.	
		U, A
2.	**Programs on variables:**	
a.	Write a program to swap two numbers without using third variable.	
b.	Write a program to find the area of rectangle, square and circle.	
c.	Write a program to find the volume of a cube, sphere, and cylinder.	
3.	**Conditional statements and loops(basic)**	**U, A, AN**
a.	Write a program to enter a number from the user and display the month name. If number >13 then display invalid input using switch case.	
b.	Write a program to check whether the number is even or odd.	
c.	Write a program to check whether the number is positive, negative or zero.	
d.	Write a program to find the factorial of a number.	
e.	Write a program to check whether the entered number is prime or not.	
f.	Write a program to find the largest of three numbers.	
4.	**Conditional statements and loops(advanced)**	**U, A, AN**
a.	Write a program to find the sum of squares of digits of a number.	
b.	Write a program to reverse the digits of an integer.	
c.	Write a program to find the sum of numbers from 1 to 100.	
d.	Write a program to print the Fibonacci series.	
e.	Write a program to find whether a given number is palindrome or not.	
f.	Write a program that solve the quadratic equation	
g.	Write a program to check whether the entered number is Armstrong or not.	
h.	Write a program to count the digit in a number	
		U, A, AN
5.	**Programs on patterns:**	
a.	Programs on different patterns.	
		U, CR
6.	**Functions**:	
a.	Programs on Functions.	
7.	**String Functions**	**U, A, AN**
a.	Programs on String Function	

8.	**Arrays**	**U, A, AN**
a.	Write a program to find the largest value that is stored in the array.	
b.	Write a program using pointers to compute the sum of all elements stored in an array.	
c.	Write a program to arrange the 'n' numbers stored in the array in ascending and descending order.	
d.	Write a program that performs addition and subtraction of matrices.	
e.	Write a program that performs multiplication of matrices.	
9.	**Pointers**	**U, CR**
a.	Write a program to demonstrate the use of pointers.	
b.	Write a program to perform addition and subtraction of two pointer variables.	
10.	**Structures and Unions**	**U, A, AN**
a.	Programs on structures.	
b.	Programs on unions.	

Learning Outcome:

1. Describe the fundamental elements of the C programming language, including variable declarations, data types, executable statements, and arithmetic expressions, demonstrating an understanding of their role in program execution. (Knowledge)
2. Differentiate between interactive mode and batch mode, and explain the process of reading and writing data files in C programs, gaining an understanding of formatting numbers for program output and identifying common programming errors. (Comprehension)
3. Design and construct repetition and loop statements in C programs, including counting loops with the while and for statements, conditional loops, nested loops, and the do-while statement with flag-controlled loops, applying iterative approximations and debugging techniques in graphics programs. (Synthesis)
4. Assess the usage of pointers, indirection operators, and modular programming in C, including functions with output parameters, multiple calls with input/output parameters, and the scope of names, and evaluate the effectiveness of debugging and testing strategies in ensuring program reliability and minimizing common programming errors related to arrays and multidimensional arrays. (Evaluation)
5. Analyze the usage of user-defined structure types, structure type data as input and output parameters, and functions with structured result values, and apply these concepts to solve programming problems using parallel arrays and arrays of structures, while identifying and resolving common programming errors related to structure and union types. (Analysis)

Books and References:

1. Hanly, J. R., & Koffman, E. B. (2013). Problem solving and program design in C (7th ed.). Pearson.
2. Kanetkar, Y. P. (2017). Let us C (16th ed.). BPB Publication.
3. Mothe, M. (2008). C for beginners (1st ed.). X-Team Series.
4. Gottfried, B. (2018). Programming with C (4th ed.). Tata McGraw Hill.
5. Mittal, A. (2010). Programming in C (1st ed.). Pearson Education.
6. Farrell, J. (2014). Programming logic and design (8th ed.). Cengage Learning.

Percentage of 6 categories of Blooms Taxonomy in question paper

	Remember	Understand	Apply	Analyze	Evaluate	Create	
% in Question Paper	10	20	30	10	10	20	100%

MCCSCT111 Web Technologies

B.Sc. (Computer Applications)		**Semester – I**		
Course Name: Web Technologies		**Course Code: MCCSCT111**		
Vertical:		**Major**		
Periods per week (1 Period is 60 minutes)		**3**		
Practical per week (1 Period is 60 minutes)		**2**		
Credits		**4**		
Evaluation System		**Duration (in Hours)**	**Total Marks**	**Minimum Passing Marks**
Theory	**Continuous Internal Assessment**	**--**	**40**	**16**
	End Semester Examination	**2**	**60**	**24**

Practical	**Continuous Internal Assessment**	**--**	**20**	**8**
	End Semester Examination	**2**	**30**	**12**

Course Objectives:

1. Students will acquire a comprehensive understanding of the Internet and its various applications, including e-mail, telnet, FTP, e-commerce, video conferencing, and e-business. They will also learn about the role of internet service providers, domain name servers, and internet addresses in the functioning of the Internet.
2. Students will grasp the fundamentals of web design, understanding its definition, exploring different web design themes, and learning the essentials of creating visually appealing and user-friendly websites. They will be introduced to HTML5, understanding its importance and advantages. They will also develop practical skills in formatting text using HTML tags, creating lists and backgrounds, and adding hyperlinks and anchors to enhance web page navigation.
3. Students will learn to effectively create and format tables using HTML5, including creating simple tables, specifying table size and column width, merging table cells, and using tables for page layout. They will also gain proficiency in applying table borders, background and foreground fills, adjusting cell padding, spacing, and alignment to enhance the visual presentation of tables.
4. Students will understand the concepts of style sheets, including constructing style rules, creating styles for nested tags, and using classes and IDs to apply styles. They will learn to create and link to external style sheets to maintain consistency across web pages.
5. Students will gain a comprehensive understanding of JavaScript, including its introduction, client-side and server-side applications, JavaScript objects, and security considerations. They will also explore the core JavaScript properties and methods of essential objects such as Array, Boolean, Date, Function, Math, Number, Object, String, and regExp and Students will become proficient in using Bootstrap 5 to design and develop modern and responsive websites.

Module	Name	Lectures
1	**Internet, World Wide Web, and HTML5: Concepts and Design**	**15**
2	**HTML5 Web Design: Tables, Forms, Media, and Style Sheets**	**15**
3	**Web Development: JavaScript, jQuery, and Bootstrap 5**	**15**
	Total	**45**

R- Remember, U- Understand, A – Apply, AN- Analyze, EV- Evaluate, CR - Create

Unit	Syllabus	Level of Knowledge

		Applicable as per Blooms Taxonomy
I	**<u>Internet, World Wide Web</u>** **A) Internet and the World Wide Web:** What is Internet? Introduction to internet and its applications, E-mail, telnet, FTP, e-commerce, video conferencing, e-business. Internet service providers, domain name server, internet address, **B) World Wide Web (WWW):** World Wide Web and its evolution, uniform resource locator (URL), browsers – internet explorer, Netscape navigator, opera, Firefox, chrome, Mozilla. search engine, web saver – apache, IIS, proxy server, HTTP protocol **C) What Is Web Design?:** Defining Web Design, Web Design Themes, Learning Web Design.	**A) U,R,A** **B)U, R** **C) U**
II	**<u>HTML5: Concepts and Design</u>** **A) HTML5:** Introduction, Why HTML5? Formatting text by using tags, using lists and backgrounds, Creating hyperlinks and anchors. **B) HTML5 Page layout and navigation:** Creating navigational aids: planning site organization, creating text based navigation bar, creating graphics based navigation bar, creating graphical navigation bar, creating image map, redirecting to another URL, creating division based layouts: HTML5 semantic tags, creating divisions, creating HTML5 semantic layout, positioning and formatting divisions.	**A) U, R, CR** **B) U, R, A, CR**
III	**<u>HTML5 Web Design: Tables, Forms, Media, and Style Sheets</u>** **A) HTML5 Tables, Forms and Media:** Creating tables: creating simple table, specifying the size of the table, specifying the width of the column, merging table cells, using tables for page layout, formatting tables: applying table borders, applying background and foreground fills, changing cell padding, spacing and alignment, creating user forms: creating basic form, using check boxes and option buttons, creating lists, additional input types in HTML5, Incorporating sound and video: audio and video in HTML5, HTML multimedia basics, embedding video clips, incorporating audio on web page. **B) Introduction to Style Sheets** : Understanding Styles, Constructing Style Rules, Creating Styles for Nested Tags, Creating Classes and IDs for Applying Styles, Applying Styles to Hyperlinks, Creating and Linking to External Style Sheets **C) Formatting Text by Using Style Sheets:** Specifying a Font Family, Specifying a Font Size and Color, Applying Bold and Italics, Applying Strikethrough and Underlining, Creating Inline Spans, Adjusting Spacing Between Letters	**A) U,R,A** **B) U,R,A,AN** **C) U,R,A,CR,EV** **D) U,R,A,CR,EV**

	D) Formatting Paragraphs by Using Style Sheets: Indenting Paragraphs, Applying a Border to a Paragraph, Specifying a Border Style, Setting Border Padding, Specifying Border Width and Color, Formatting Border Sides Individually, Setting All Border Attributes at Once, Specifying the Horizontal Alignment of a Paragraph, Specifying Vertical Space within a Paragraph.	
IV	**Web Development: JavaScript, jQuery** **A) Java Script:** Introduction, Client-Side JavaScript, Server-Side JavaScript, JavaScript Objects, JavaScript Security Core JavaScript (Properties and Methods of Each) : Array, Boolean, Date, Function, Math, Number, Object, String, regExp **B) jQuery Introduction**, jQuery Syntax, jQuery Selectors,jQuery Event Methods,jQuery Effects, jQuery HTML, jQuery Traversing, jQuery AJAX	**A) U,R,A,CR,EV** **B) U,R,A,CR,EV**
V	**Bootstrap 5** BS5 HOME,BS5 Get Started,BS5 Containers,BS5 Grid Basic, BS5 Typography,BS5 Colors,BS5 Tables, BS5 Images,BS5 Jumbotron,BS5 Alerts, BS5 Buttons,BS5 Button Groups,BS5 Badges,BS5 Progress Bars,BS5 Spinners, BS5 Pagination,BS5 List Groups,BS5 Cards,BS5 Dropdowns,BS5 Collapse, BS5 Navs,BS5 Navbar,BS5 Forms, BS5 Inputs,BS5 Input Groups, BS5 Custom Forms,BS5 Carousel, BS5 Modal,BS5 Tooltip,BS5 Popover, BS5 Toast,BS5 Scrollspy, BS5 Utilities, BS5 Flex, BS5 Icons, BS5 Media Objects, BS5 Filters	**A) U,R,A,CR**

List of Practical:		
SR No	**Syllabus**	**Level of Knowledge Applicable as per Blooms Taxonomy**
1.	**Use of Basic Tags:**	
a.	Design a web page using different text formatting tags.	U,R,A,CR
b.	Demonstrate use of Font tag with its attributes and HTML various color options in web page.	
c.	Design a web page with links to different pages and allow navigation between web pages.	

2.	**Navigation, list and paragraph:**	U,R,A,CR
a.	Design a web page to demonstrate text-based navigation bar.	
b.	Demonstrate use of lists and backgrounds in web page.	
c.	Demonstrate use of paragraph and its associated tags in web page.	
3.	**Lists, images and semantics:**	U,R,A,CR
a.	Demonstrate use of multiple image tag in web page.	
b.	Design a web page with Imagemaps.	
c.	Design a web page demonstrating use of various semantics tags	
4.	**Multimedia and User controls:**	U,R,A,CR
a.	Design a web page with a form that uses all types of user controls.	
b.	Design a web page embedding with multimedia features.	
c.	Design a 3 page static website with appropriate tags and attributes.	
5.	**CSS with list, links and table:**	U,R,A,CR
a.	Create and use different style rules with available types of lists.	
b.	Create and use different style rules with hyperlinks.	
c.	Create and use different style rules with tables.	
6.	**CSS with font, paragraph and types:**	U,R,A,CR
a.	Create and use different style rules with font elements.	
b.	Create and use different style rules with Paragraph elements.	
c.	Demonstrate the use of inline, internal and external CSS in one web page.	
7.	**Java Script: Validating User fields**	U,R,A,CR
a.	Demonstrate the use of Document object methods.	
b.	Using java script, demonstrate validating Text Input Fields, Drop-down Lists and Checkboxes.	
c.	Using java script, demonstrate validating Radio buttons and Validating Multi-Select Boxes.	
8.	**Java Script : Handling the events – I**	U,R,A,CR
a.	Using java script, demonstrate the use of onAbort, onBlur, onChange, onClick, onDblClick events.	
b.	Using java script, demonstrate the use of onDragDrop, onError, onFocus events.	
9.	**Java Script : Handling the events – II**	U,R,A,CR
a.	Using java script, demonstrate the use of onKeyDown, onKeyPress, onKeyUp, onLoad, onReset, onResize, onSelect, onSubmit, onUnload events.	

b.	Using java script, demonstrate the use of onMouseDown, onMouseMove, onMouseOut, onMouseOver, onMouseUp, onMove events.	
c.	Using java script, demonstrate the use of onKeyDown, onKeyPress, onKeyUp, onLoad, onReset, onResize, onSelect, onSubmit, onUnload events.	
d.	Demonstrate complete validation of User Registration form using appropriate fields of html and events of java script.	
10.	Design a Website using multiple JQuery Elements and demonstrate it.	U,R,A,CR

Learning Outcomes:

1. Identify the key features and benefits of HTML5 semantic tags and their role in modern web design. (Knowledge)
2. Evaluate the effectiveness of different HTML5 semantic tags and layout techniques in various web design scenarios. (Analysis)
3. Apply HTML5 tags and attributes to create well-structured tables, user-friendly forms, and multimedia-integrated web pages. (Application)
4. Explain the concept of using HTML5 forms to collect user input and understand the differences between various input types. (Comprehension)
5. Identify the core components and features of Bootstrap 5. (Knowledge)

Books and References:

1. Wempen, F. (2011). HTML5 step by step. Microsoft Press.
2. Powell, T. (2009). Web design: The complete reference. Tata McGraw-Hill.
3. Freeman, E. (2013). Head first HTML5 programming. O'Reilly.
4. Powell, T., & Schneider, F. (2004). JavaScript 2.0: The complete reference (2nd ed.). Tata McGraw-Hill.
5. York, R. (2015). Web development with jQuery. Wrox.
6. Foreman, D. (2021). Bootstrap 5 foundation. Independently Published.

Percentage of 6 categories of Blooms Taxonomy in question paper

	Remember	Understand	Apply	Analyze	Evaluate	Create	
% in Question Paper	**10**	**20**	**10**	**30**	**20**	**10**	**100%**

MCCMATH101 Basic Mathematics

B.Sc. (Computer Applications)		**Semester – I**		
Course Name: Basic Mathematics		**Course Code: MCCMATH101**		
Vertical:		**Minor**		
Periods per week (1 Period is 60 minutes)		**2**		
Practical per week (1 Period is 60 minutes)		**--**		
Credits		**2**		
		Duration (in Hours)	**Total Marks**	**Minimum Passing Marks**
Evaluation System	**Continuous Internal Assessment**	**--**	**20**	**8**
	End Semester Examination	**1**	**30**	**12**

Course Objectives:

1. Develop a strong understanding of algebraic principles, including solving linear and quadratic equations, working with real numbers, and applying logic in mathematical expressions.
2. Acquire foundational skills in intuitive geometry (distance, angles, isometries, area) and coordinate geometry (operations on points, segments, rays, and lines) to analyze geometric problems in various contexts.
3. Gain proficiency in understanding and applying key trigonometric concepts, including radian measure, the sine and cosine functions, and the use of addition formulas in solving problems related to rotations and graphing.
4. Explore the concepts of functions and mappings, including their definitions, properties, and practical applications in polynomial and exponential functions, logarithms, and permutations.
5. Understand the fundamentals of complex numbers, mathematical induction, summations, and determinants, and apply these concepts to solve problems in algebra, geometry, and matrices.

Module	**Name**	**Lectures**

I	**Algebra**	**6**
II	**Geometry and Coordinate Geometry Basics**	**6**
III	**Trigonometry**	**6**
IV	**Functions and Mappings**	**6**
V	**Complex Numbers, Induction, and Determinants**	**6**
	Total	**30**

R- Remember, U- Understand, A – Apply, AN- Analyze, EV- Evaluate, CR - Create		
Unit	**Syllabus**	**Level of Knowledge Applicable as per Blooms Taxonomy**
I	**Algebra:** Numbers, Linear Equations, Real Numbers, Quadratic Equations, Logic and Mathematical Expressions.	**R, U, A, AN, EV**
II	**Geometry and Coordinate Geometry Basics** **A) Intuitive Geometry:** Distance and Angles, Isometries, Area and Applications **B) Coordinate Geometry:** Coordinates and Geometry, Operations on Points, Segments, Rays, and Lines	**A) R, U, A, AN, EV** **B) R, U, A, AN**
III	**Trigonometry:** Radian measure, Sine and cosine, The graphs, The tangent, Addition formulas, Rotations	**R, U, A, AN, CR**
IV	**Functions and Mappings** **A) Functions:** Definition of a function, Polynomial functions, Graphs of functions, Exponential function, Logarithms. **B) Mappings:** Definition, Formalism of mappings, Permutations.	**A) R, U, AN, EV, CR** **B) R, U, A, AN, EV**
V	**Complex Numbers, Induction, and Determinants** **A) Complex Numbers:** The complex plane, Polar form, Algebra of Complex numbers. **B) Induction and Summations:** Induction, Summations, Geometric series. Determinants: Matrices, Determinants of order 2, Properties of 2 X 2 determinants, Determinants of order 3, Properties of 3 X 3 determinants, Cramer's Rule	**A) R, U, A, AN** **B) R, U, A, AN**

Learning Outcomes: After completion of Course, the learners will be able to:

1. Identify and solve linear and quadratic equations, apply properties of real numbers, and use logical reasoning to simplify mathematical expressions.
2. Analyze and apply geometric principles, such as calculating distance and angles, performing isometries, and solving geometric problems using coordinate geometry.

3. Apply trigonometric functions, such as sine, cosine, and tangent, to solve problems involving rotations and graphs, and use addition formulas to simplify trigonometric expressions.
4. Define, analyze, and graph polynomial, exponential, and logarithmic functions, and apply the concept of mappings and permutations to various mathematical problems.
5. Perform operations on complex numbers, use induction to prove mathematical statements, and solve problems involving determinants and systems of equations using Cramer's Rule.

Books and References:

1. Lang, S. (n.d.). Basic mathematics. Addison-Wesley Publishing Company.
2. Stewart, J. (2015). Calculus: Early transcendentals (8th ed.). Brooks/Cole.
3. Larson, R., & Edwards, B. H. (2013). Elementary linear algebra (6th ed.). Brooks/Cole.
4. Anton, H., & Rorres, C. (2014). Elementary linear algebra (11th ed.). Wiley.
5. Tussy, A. L., & Gustafson, D. (2015). Intermediate algebra (5th ed.). Cengage Learning.
6. Lial, M. L., Hornsby, J., & McGinnis, D. I. (2017). College algebra (11th ed.). Pearson Education.

Percentage of 6 categories of Blooms Taxonomy in question paper

	Remember	Understand	Apply	Analyze	Evaluate	Create	
% in Question Paper	20	20	10	20	20	10	100%

MCCSB112 Essentials of Management

B. Sc (Computer Applications)	**Semester – I**		
Course Name: Essentials of Management	**Course Code: MCCSB112**		
Vertical:	**General / Open Elective**		
Periods per week (1 Period is 60 minutes)	**2**		
Practical per week (1 Period is 60 minutes)	**--**		
Credits	**2**		
Evaluation System	**Duration (in Hours)**	**Total Marks**	**Minimum Passing Marks**

Continuous Internal Assessment	**--**	**50**	**20**

Course Objectives:

1. To understand the evolution of management theories and explore the key concepts and approaches to effective management, including planning and decision-making techniques.
2. To develop an understanding of decision-making processes and organizing principles in management, along with the techniques that enhance decision-making efficiency.
3. To explore the significance of departmentation and span of control in organizational structure, and understand the impact of centralization and decentralization on management practices.
4. To examine the dynamics of delegation, directing, and leadership styles in management, focusing on effective authority-responsibility relationships and leadership qualities.
5. To explore modern management practices such as coordination, controlling, and the influence of emerging trends like remote work, technology, and knowledge management in the global business environment.

Module	Name	Lectures
1	**Foundations of Management: Evolution, Concepts, Planning, and Approaches**	**6**
2	**Core Management Functions: Decision Making and Organizing Principles**	**6**
3	**Organizational Structure: Departmentation and Span of Control**	**6**
4	**Leadership and Management: Delegation, Directing, and Leadership Styles**	**6**
5	**Modern Management Practices: Coordination, Controlling, and Emerging Trends**	**6**
	Total	**30**

R- Remember, U- Understand, A – Apply, AN- Analyze, EV- Evaluate, CR - Create		
Module	**Syllabus**	**Lectures**
I	**<u>Foundations of Management: Evolution, Concepts, Planning, and Approaches</u>** **A) Management & Evolution** – Concept, Significance, Role & Skills, Levels of Management, Managerial Grid, F.W. Taylor, Henry Fayol, Contingency Approach **B) Planning –** Meaning, Importance, Process, Elements, Limitations, MBO.	A) R, U, A, AN B) R, U
II	**<u>Core Management Functions: Decision Making and Organizing Principles</u>**	A) R, U B) R, U

	A) Decision Making – Meaning, Importance, Process, Techniques **B) Organising –** Concepts, Structure, Meaning, Advantages, Limitations	
III	**<u>Organizational Structure: Departmentation and Span of Control</u>** **A) Departmentation –** Meaning, Basis, Significance **B) Span of Control** – Meaning, Factors Affecting Centralisation & Decentralisation	**A)** R, U **B)** R, U
IV	**<u>Leadership and Management: Delegation, Directing, and Leadership Styles</u>** **A) Delegation –** Authority & Responsibility Relationship **B) Directing –** Meaning & Process **C) Leadership** – Meaning, Styles, Qualities of a Good Leader	A) R, U, A, AN B) R, U ,A C) R, U
V	**<u>Modern Management Practices: Coordination, Controlling, and Emerging Trends</u>** **A) Coordinating –** Co-ordination as an essence of management **B) Controlling –** Meaning, Process & Techniques **C) Recent Trends -** Crisis, Risk, Global, Boundary less, Remote / WFH, Technology & Management, Knowledge Management	A) R, U **B)** R, U **C)** R, U,AN

Learning Outcomes: After completion of Course, the learners will be able to:

1. Understand the significance of management theories and approaches in shaping effective management practice
2. Remember the key decision-making techniques and organizing principles in management.
3. Apply the concepts of departmentation and span of control in real-world organizational structures.
4. Analyze the relationship between authority and responsibility in delegation and its impact on leadership effectiveness.
5. Understand the role of coordination and controlling in modern management practices.

Books and References:

1. Koontz, H., & O'Donnell, C. (n.d.). Essentials of management. McGraw Hill.
2. Ramasamy, S. (n.d.). Principles of management. Himalaya Publishing.
3. Bhivpathki, D. P. (n.d.). Principles and practices of management. Everest Publishers.
4. Tripathi, P. C., & Reddy, P. N. (n.d.). Principles of management. Tata McGraw Hill.
5. Koontz, H., & Weihrich, H. (2010). Essentials of management (8th ed.). McGraw Hill.
6. Robbins, S. P., & Coulter, M. (2017). Management (13th ed.). Pearson Education.

Percentage of 6 categories of Blooms Taxonomy in Evaluation

	Remember	Understand	Apply	Analyze	Evaluate	Create	
% in Question Paper	30	30	30	10	-	-	100%

MCCSB113 Group Dynamics and Leadership Skills

B. Sc (Computer Applications)	**Semester – I**		
Course Name: Group Dynamics and Leadership Skills	**Course Code: MCCSB113**		
Vertical:	**General / Open Elective**		
Periods per week (1 Period is 60 minutes)	**2**		
Practical per week (1 Period is 60 minutes)	**--**		
Credits	**2**		
Evaluation System	**Duration (in Hours)**	**Total Marks**	**Minimum Passing Marks**
Continuous Internal Assessment	**--**	**50**	**20**

Course Objectives:

1. To understand the meaning, definition, and scope of Organizational Behavior (OB), and recognize its emerging trends and challenges.
2. To analyze the major job attitudes, job satisfaction, personality determinants, and the principles of learning in an organizational context.
3. To explore the concept of group dynamics, theories of group formation, and the role of communication and conflict management within teams.
4. To understand the concept of motivation, examine key motivation theories, and explore leadership traits and their impact on organizational success.
5. To understand the significance of organizational culture, factors influencing it, and the role of stress management and organizational change in maintaining workplace well-being.

Module	Name	Lectures
1	**Introduction & Individual Behaviour I**	**6**
2	**Introduction & Individual Behaviour II**	**6**
3	**Group Dynamics**	**6**
4	**Motivation: & Leadership**	**6**

5	**Organisation Culture and Development**	**6**
	Total	**30**

R- Remember, U- Understand, A – Apply, AN- Analyze, EV- Evaluate, CR - Create

Unit	Syllabus	Level of Knowledge Applicable as per Blooms Taxonomy
I	**Introduction & Individual Behaviour I** Meaning, Definition, Importance, Nature, Scope of OB, Emerging trends in OB, Challenges and Opportunities Foundations of Individual Behavior Attitudes and Job Satisfaction, Components of Attitude	**U, R**
II	**Introduction & Individual Behaviour II:** Major Job Attitude, Job Satisfaction, Personality and Values, Personality Determinants, Values, Formation, Types of Values, Learning, & Principles of Learning, Perception, Factors influencing perception.	**U, R**
III	**Group Dynamics:** Concept of Group Dynamics and Teams, Theories of Group Formation, Team Development, Communication: Concept of two-way & Open Communication, Conflict Management	**U, R**
IV	**Motivation: & Leadership** Concept of motivation, Definition, Theories of Motivation, Maslow's need Theory, Two Factor Theory, Concept of Leadership, Traits of good Leader, Difference between Leader.	**U, R,A**
V	**Organisation Culture and Development-** Meaning, Importance, Factors influencing Organization Culture, Organizational Change, Stress Management, Concept of stress, Sources & Effects of stress on humans, Management of Stress.	**U, R, A**

<u>Learning Outcomes</u>: After completion of Course, the learners will be able to

1. Explain the importance and scope of Organizational Behavior in the modern workplace.
2. Recall the different types of values and describe how they influence individual personality.
3. Describe the key theories of group formation and the concept of effective team development.

4. Apply Maslow's Need Hierarchy Theory to assess employee motivation in a workplace scenario.
5. Demonstrate stress management strategies to address workplace stress and enhance productivity.

Books & References:

1. McShane, S. L., Von Glinow, M. A., & Rai, H. (2022). Organizational behavior (9th ed.). Tata McGraw-Hill Publishing Co.
2. Robbins, S. P., & Judge, T. A. (2016). Organizational behavior (16th ed.). Pearson Education.
3. Luthans, F. (2011). Organizational behavior (12th ed.). McGraw-Hill Education.
4. Sharma, K. (2013). Organizational behaviour: Text and cases (2nd ed.). Pearson India.
5. Griffin, R. W., & Moorhead, G. (2013). Organizational behavior: Managing people and organizations (11th ed.). Cengage Learning.
6. Newstrom, J. W., & Davis, K. (2001). Organizational behavior: Human behavior at work (11th ed.). McGraw-Hill Education.

Percentage of 6 categories of Blooms Taxonomy in question paper

	Remember	Understand	Apply	Analyze	Evaluate	Create	
% in Question Paper	**40**	**40**	**20**	**-**	**-**	**-**	**100%**

MCCENG108 Enhancing Soft Skills

B.Sc. (Computer Applications)	**Semester – I**
Course Name: Enhancing Soft Skills	**Course Code: MCCENG108**
Vertical:	**Ability Enhancement Course**
Periods per week (1 Period is 60 minutes)	**02**
Practical per week (1 period is 60 minutes)	**-**

Credits	02		
Evaluation System	**Duration (in Hours)**	**Total Marks**	**Minimum Passing Marks**
Continuous Internal Assessment	**-**	**50**	**20**

Objectives of the Course:

1. The purpose of the course is to equip students with essential soft skills that complement their technical knowledge.
2. This course will enhance students' ability to communicate effectively, demonstrate emotional intelligence, and work collaboratively in professional environments.
3. Key concepts such as communication techniques, emotional intelligence, leadership, and decision-making will be explored and applied to real-world situations.
4. These soft skills will be valuable in their careers, aiding in effective teamwork, problem-solving, career readiness, and success in the workplace.

Module	Name	Lectures
I	**Soft Skills in the National and Global Context**	**5**
II	**Social and Emotional Intelligence**	**6**
III	**Communication Essentials**	**6**
IV	**Interpersonal Skills & Workplace Effectiveness**	**7**
V	**Career Readiness and Professional Growth**	**6**
	Total	**30**

R- Remember, U- Understand, A – Apply, AN- Analyze, EV- Evaluate, CR – Create

Module / Unit	Syllabus As per SSC framework of NEP	Level of Knowledge Applicable as per Blooms Taxonomy

I	**Soft Skills in the Global and National Context** Introduction to Soft Skills, Soft Skills vs Hard Skills, Skills to Master, Academia – Industry Connect, Softening of the Hard Skills, Interdisciplinary Relevance, Global Perspectives on Soft Skills, National and Global Initiatives (India's NEP, Skill India, and employability programs).	R, U, AN, EV
II	**Social and Emotional Intelligence** **A) Emotional Intelligence:** Meaning and Definition, Need for Emotional Intelligence, Intelligence Quotient versus Emotional Intelligence Quotient, Components of Emotional Intelligence, Competencies of Emotional Intelligence, Skills to Develop Emotional Intelligence. **B) Personality Development:** Knowing Yourself, Positive Thinking, Johari's Window, Communication Skills, Physical Fitness. **C) Etiquette and Mannerism:** Introduction, Professional Etiquette, Technology Etiquette	A) R, U, A, AN B) U, A, EV C) R, U, A, AN
III	**Communication Essentials** **A) The Seven Cs of Effective Communication** - Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness), Significance of Communication. **B) Professional Presentation:** Nature of Oral Presentation, planning a Presentation, Preparing the Presentation, Delivering the Presentation. **C) Group Discussion:** Introduction, Ambience/Seating Arrangement for Group Discussion, Importance of Group Discussions, Difference between Group Discussion, Panel Discussion and Debate, Traits, Types of Group Discussions, topic based and Case based Group Discussion, Individual Traits.	A) R, U, A B) U, A, EV, CR C) R, U, A, AN, EV
IV	**Interpersonal Skills & Workplace Effectiveness** **A) Creativity at Workplace:** Introduction, Current Workplaces, Creativity, Motivation, Nurturing Hobbies at Work, The Six Thinking Hat Method. **B) Capacity Building: Learn, Unlearn and Relearn**: Capacity Building, Elements of Capacity Building, Zones of Learning, Ideas for Learning, Strategies for Capacity Building. **C) Leadership and Team Building:** Leader and Leadership, Leadership Traits, Culture and Leadership, Leadership Styles and Trends, Team Building, Types of Teams, Building and Nurturing relationships in a team. **D) Decision Making and Negotiation:** Introduction to Decision Making, Steps for Decision-Making, Decision-	A) R, U, A, AN, EV B) U, A, AN C) U, A, AN, EV D) U, A, AN, EV

	Making Techniques, Negotiation Fundamentals, Negotiation Styles, Major Negotiation Concepts.	
V	**Career Readiness and Professional Growth** **A) Job Interviews:** Introduction, Importance of Resume, Definition of Interview, Background Information, Types of Interviews, Preparatory Steps for Job Interviews, Interview Skill Tips, Changes in the Interview Process, FAQ During Interviews Interview Skill Tips, Changes in the Interview Process, FAQ During Interviews. Interview Trends **B) Stress and Time Management:** Stress, Sources of Stress, Ways to Cope with Stress, Effective ways for Time Management.	A) R, U, A, AN, EV, CR B) U, A, AN, EV

Learning Outcomes: After completion of Course, the learners will be able to:

1. Understand and analyze the role of soft skills in professional and academic success, and evaluate global and national initiatives.
2. Develop emotional awareness, manage relationships, and demonstrate professional behavior through etiquette and personal insight.
3. Apply effective communication strategies, in professional presentations and group discussions across diverse and digital contexts.
4. Acquire skills in creativity, leadership, capacity building, decision making, and negotiation, and understand how these contribute to workplace effectiveness and team dynamics.
5. Acquire practical tools and techniques for job preparation, resume writing, and successful performance in evolving interview scenarios; manage stress, and implement time management strategies to enhance career readiness.

Books & References:

1. Chauhan, G., & Sharma, S. (2016). *Soft Skills: An Integrated Approach to Maximise Personality* (1st ed.)., Wiley India

2. Ghosh, B. (2017). *Managing Soft Skills for Personality Development* (1st ed.)., McGraw Hill India
3. Mitra, B. (2016). *Personality Development and Soft Skills* (2nd ed.)., Oxford University Press
4. Kalia, S., & Agrawal, S. (2015). *Business Communication - A Practice-Oriented Approach* (1st ed.)., Wiley India
5. Sherfield., & Montgomery, M. (2011). *Cornerstone: Developing Soft Skills* (4th ed.)., Pearson India
6. Biech, E. (2017). *The Art and Science of Training* (3rd ed.)., Pfeiffer.
7. Anwar, M. (2016). *Communication Skills for Engineers* (1st ed.)., Springer.
8. Zhao, D., & Xu, K. (2018). *Technical Communication: A Practical Approach* (2nd ed.)., Pearson.

Percentage of 6 categories of Blooms Taxonomy in question paper

	Remember	Understand	Apply	Analyze	Evaluate	Create	
% in Question Paper	20	25	30	15	10	-	100%

MCCSCTEVS101 Green Computing

B.Sc (Computer Applications)		**Semester – I**		
Course Name: Green Computing		**Course Code: MCCSCTEVS101**		
Vertical:		**Value Education Course**		
Periods per week (1 Period is 60 minutes)		**3**		
Practical per week (1 Period is 60 minutes)		**2**		
Credits		**4**		
Evaluation System		**Duration (in Hours)**	**Total Marks**	**Minimum Passing Marks**
Theory	**End Semester Examination**	**2**	**60**	**24**
	Continuous Internal Assessment	**--**	**40**	**16**
Project	**Project**	**--**	**50**	**20**

Course Objectives:

1. Students will learn about environmental challenges in IT operations, including power issues and monitoring. They will explore cost-effective solutions like data de-duplication, virtualization, and management. The course focuses on optimizing power use and reducing hardware and energy costs.
2. Enable students to learn how technology and innovation support climate change adaptation and sustainable solutions. They will explore adaptation funding, the innovation ecosystem, and green technology transfer. The course also covers intellectual property and patents in technological advancements.
3. Educate student about technological advancements in agriculture and forestry for climate adaptation. Students will explore patents, financing, irrigation, and farming technologies. It also includes forest management, early warning systems, and ecosystem monitoring.
4. Provide students to explore technological advancements in coastal and water management. Students will learn about patents, financing, flood prevention, and water conservation. It also covers coastal protection, water treatment, and marine ecosystem sustainability.
5. Familiarize students to focuses on technological advancements for resilient urban development. It covers patents, financing, infrastructure, and early warning systems. Students will also explore urban planning, monitoring, and sustainable solutions.

Module	Name	Lectures
I	**Green IT & Efficiency**	**09**
II	**Climate Technology & Innovation**	**09**
III	**Adaptation in Agriculture and Forestry**	**09**
IV	**Coastal & Water Solutions**	**09**
V	**Urban Technology & Resilience**	**09**
	Total	**45**

R- Remember, U- Understand, A – Apply, AN- Analyze, EV- Evaluate, CR - Create

Unit	Details	Level of Knowledge Applicable as per Blooms Taxonomy
I	**<u>Green IT & Efficiency:-</u>** **A) Overview and Issues:** Problems: Toxins, Power Consumption, Equipment Disposal, Company's Carbon Footprint: Measuring, Details, reasons to bother, Plan for the Future, Cost Savings: Hardware, Power. **B) Minimizing Power Usage:** Power Problems, Monitoring Power Usage, Servers, Low-Cost	**A) U, R** **B) U, R, AN**

	Options, Reducing Power Use, Data De-Duplication, Virtualization, Management, Bigger Drives, Involving the Utility Company, Low Power Computers, PCs, Linux, Components, Servers, Computer Settings, Storage, Monitors, Power Supplies, Wireless Devices, and Software.	
II	**Climate Technology & Innovation:-** A) **Climate Change adaptation and technology:-** Climate change adaptation ,Technology and innovation as part of the solution , Adaptation funding **B) Innovation and transfer solutions: -** The innovation ecosystem, Intellectual property in green technology transfer, Technological knowledge within the patent system.	**A) U, R, A** **B) U, R, AN**
III	**Adaptation in Agriculture and Forestry:-** **A) Agriculture and Forestry:-** Technology developments and trends, Patents and finance, Climate-resilient plants, Healthy Soils, Farming technologies, Irrigation, Livestock, Forest and ecosystem management, Early warning systems, modelling and monitoring.	**A) U, R, A, EV**
IV	**Coastal & Water Solutions:-** A) **Water and coastal regions: -** Technological developments and trends, Patents and finance, Coastal protection, Flood prevention and control, Water treatment, Water efficiency and conservation, Marine ecosystems.	**A) U, R, A, EV**
V	**Urban Technology & Resilience:-** A) Technological developments and trends , Patents and finance , Urban planning , Buildings Infrastructure and services, Early warning systems, modelling and monitoring.	**A) U, R, A, EV**

Suggested List of Projects:	
1.	Carbon footprint
a.	Measuring the carbon footprint of campus.
b.	Measuring the carbon footprint, a small MIDC Company.
c.	Carbon footprint for FMCG companies
d.	Corporate Carbon Footprint And Carbon Neutrality.
e.	Measures to reduce carbon footprint
2.	Energy Conservation
a.	Plan to Cut down Your Electricity Bill (Here every individual student can target the 5 houses nearby its home. Get their last month's electricity bill. From current months onwards suggest the ways for saving

	the energy to all the peoples in that houses. Continuously whenever possible educate the peoples concerned and guide them on several energy saving ideas. By the end of second month observe the reduction in the electricity bills and present the observations in the form of project report.)
b.	Measuring and monitoring use of Power in XXX Company.
c.	A survey of steps taken to be energy efficient by Malls / Shopping centers
d.	Energy Efficient cooling solutions for homes and offices
e.	Electricity Smart Grids and smart energy systems
3.	**Recycling:**
a.	Recycling of IT waste in Colleges.
b.	Recycling vs. Reuse
c.	Recycling initiatives taken up by XXX Housing Society: A Case Study
d.	Damage caused by improper recycling of e-waste in developing countries like India or China
4.	**Paperless:**
a.	A Case study of a traditional company going paperless with the use of Electronic media
b.	Going paperless in Government Departments
c.	Challenges in going paperless in Indian Context
d.	Economic benefits of going Paperless
5.	**Datacenters**
a.	Survey of best energy-efficient practices in data centers around the world.
b.	Designing a datacenter with use of green technology.
c.	Design considerations of datacentres for efficient cooling
d.	Impact of Datacenters on the environment
6.	**Build a prototype/Working model of a wind turbine at home.** (With small amount of money spending students can build a wind turbine that can generate small amount of electricity. There are many ideas and secure steps are available on the internet regarding this. Under the guidance of the teacher students can prepare the one along with the report stating the procedure and outcome.)
7.	Build a prototype/Working model of a simple solar equipment's. **Ex. Oven**
8.	Build a prototype/Working model of Water Purification System.
9.	Rain water harvesting model preparation.
10.	Paper bag making and distributing. (Students can easily make significant number of paper bags and distribute them among the houses nearby and to the hawkers to avoid the plastic bags.)
11.	Creating greywater recycling system.
12.	Waste Management: Evaluate How to reduce packaging waste at home.
13.	Creating a balanced ecosystem model , e.g. an Aquarium
14.	Creating organic garden model.
15.	Making best out of E-waste.
16.	Student research project to study sustainable energy solution for India.
17.	Submitting a small research study on National Mission for a Green India (GIM).

18.	Submitting a small research study on Indian Green Building Council (IGBC).
19.	Submitting a small research study on LEED INDIA.
20.	Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal.
21.	Initiatives taken by Europe to reduce the toxic effect of e-waste on environment
22.	E Parisaraa - India's First E Waste.
23.	WEEE Recycle India - E-Waste Collection Centres in Bangalore.
24.	E-waste management rules implemented by Ministry of Electronics & Information Technology by Government of India.
25.	Submitting a small research study on The Indian Council of Agricultural Research.

Rules for project and Documentation:

1. A project should be done based on the objectives of green computing. A report of minimum 50 Pages should be prepared. The report should have font size of 12, Times New Roman and 1.5 line spacing. The Heading should have font size 14. The report should be hard bound.
2. The project can be done individually.
3. The student will have to present the project during the examination.
4. A certified copy of the project report is essential to appear for the examination.

Learning Outcomes: After completion of Course, the learners will be able to:

1. Recall strategies to reduce IT-related environmental impacts by optimizing power usage, managing e-waste, and implementing cost-effective, energy-efficient technologies. (Remember).
2. Apply innovative technologies and funding strategies for climate change adaptation and sustainable solutions. (Apply)
3. Analyze technological advancements to enhance climate resilience in agriculture and forestry. (Analyze).
4. Critically evaluate technological solutions for coastal protection, water conservation, and sustainable marine ecosystem management. (Evaluate).
5. Develop innovative urban planning strategies using technological advancements and resilience measures for sustainable cities. (Create).

Books and References:

1. Velte, T., Velte, A., & Elsenpeter, R. (2008). Green IT. McGraw Hill.
2. World Intellectual Property Organization (WIPO). (2022). Green technology book 2022: Solutions for climate change adaptation. WIPO.
3. Galea, A., Schaefer, M., & Ebbers, M. (2008). Green data center: Steps for the journey. Shroff Publishers and Distributors.
4. Harris, J. (2008). Green computing and green IT best practice. Emereo.

5. Smith, B. E. (2014). Green computing: Tools and techniques for saving energy, money, and resources. CRC Press.
6. Rouse, M. (2019). Sustainable IT: A guide to environmentally responsible technology. Apress.

Percentage of 6 categories of Blooms Taxonomy in question paper

	Remember	Understand	Apply	Analyze	Evaluate	Create	
% in Question Paper	30	30	10	10	10	10	100%