SRI VIDYA MANDIR ARTS & SCIENCE COLLEGE

(Autonomous)

[An Autonomous College Affiliated to Periyar University, Salem, Tamil Nadu]

[Accredited by NAAC with 'A' Grade with CGPA of 3.27]

[Recognized 2(f) & 12(B) Status under UGC Act of 1956]

Katteri – 636 902, Uthangarai (Tk), Krishnagiri (Dt)

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DEGREE OF BACHELOR OF SCIENCE IN

COMPUTER SCIENCE

CHOICE BASED CREDIT SYSTEM (CBCS)

REGULATIONS AND SYLLABUS FOR

BSC COMPUTER SCIENCE PROGRAMME

(SEMESTER PATTERN)

(For Students Admitted in the College from the Academic Year 2020-2021 Onwards)

Programme Outcomes (POs)

PO1	Understand fundamental concepts of key areas in Computer Science and enable students expose technical, analytical and creative skills.
PO2	Build student's effective communication, ethical attitudes, team work and logical proficiency.
PO3	Students are to be passionately engaged in primary learning with intend to think differently, understanding and applying knowledge of mathematical, algorithmic and computing skills to acquire employability.
PO4	Students are to be imparted with a broad conceptual background in the Computing sciences to design, implement and evaluate a computational system.
PO5	Make use of modern tools and techniques to develop practical skills for fulfilling the needs of industry and society.

Programme Specific Outcomes (PSOs)

PSO1	Possess basic knowledge on core concepts of Computer Science the knowledge of Computer Science through theory and practicals.
PSO2	Demonstrate mastery of Computer Science in the following core knowledge areas • Data Structures and Programming Languages • Databases, Software Engineering and Web Development • Operating System and Computer Hardware
PSO3	Apply problem-solving skills and the knowledge of programming languages in computer science to solve real world problems.
PSO4	Empowered with analytical mind and critical thinking.
PSO5	Develop practical skills to fulfill the needs of industry and society

SRI VIDYA MANDIR ARTS & SCIENCE COLLEGE
(Autonomous)
Bachelor of Science (B.Sc.) in Computer Science
Programme Pattern and Syllabus (CBCS)

(For Students Admitted in the College from the Academic Year 2020-2021 Onwards)

Sl. No.	Part	Nature of Course	Course Code	Name of the Course	Hours/ Week	Credits	Marks		
							CIA	ESE	Total
				SEMESTER I					
1	I	Language	20UTA1F01	Tamil – I	5	3	25	75	100
2	II	English	20UEN1F01	English – I	5	3	25	75	100
3	III	Core – I	20UCS1C01	Programming in Python	5	3	25	75	100
4		Core – II	20UCS1C02	Digital Computer Fundamentals	5	3	25	75	100
5		Core Practical – I	20UCS1P01	Programming in Python Lab	3	2	40	60	100
6		Allied – I	20UMA1A01	Mathematics – I	5	3	25	75	100
7	IV	Value Education	20UVE101	Yoga	2	2	25	75	100
		Total			30	19	190	510	700
				SEMESTER II					
8	I	Language	20UTA2F02	Tamil – II	5	3	25	75	100
9	II	English	20UEN2F02	English – II	5	3	25	75	100
10	III	Core – III	20UCS2C03	Programming in C	5	3	25	75	100
11		Core – IV	20UCS2C04	Data Structures & Algorithms	4	3	25	75	100
12		Core Practical – II	20UCS2P02	Data Structure using C Lab	3	3	40	60	100
13		Allied – II	20UMA2A02	Mathematics – II	4	3	25	75	100
14	IV	SBEC – I	20UCS2S01	Office Automation Lab	2	2	40	60	100
15		Common Course	20UES201	Environmental Studies	2	2	25	75	100
		Total			30	22	230	570	800
				SEMESTER III					
16	I	Language	20UTA3F03	Tamil – III	5	3	25	75	100

17	II	English	20UEN3F03	English – III	5	3	25	75	100
18		Core – V	20UCS3C05	Programming in C++	5	3	25	75	100
19		Core – VI	20UCS3C06	Operating Systems	5	3	25	75	100
20	III	Core Practical – III	20UCS3P03	Programming in C++ Lab	3	3	40	60	100
21		Allied – I	20UCM3A01	Principles of Accountancy	5	3	25	75	100
22	IV	NMEC – I		Non Major Elective Course – I	2	2	25	75	100
Total					**30**	**20**	**190**	**510**	**700**

SEMESTER IV

23	I	Language	20UFTA04	Tamil – IV	5	3	25	75	100
24	II	English	20UFEN04	English – IV	5	3	25	75	100
25		Core – VII	20UCS4C07	Web Technology	4	3	25	75	100
26		Core – VIII	20UCS4C08	Software Engineering	4	3	25	75	100
27	III	Core Practical – IV	20UCS4P04	Web Technology Lab	2	3	40	60	100
28		Allied – II	20UCM4A02	Cost and Management Accounting	4	3	25	75	100
29		Allied – II Practical	20UCM4AP01	Allied Commerce Practical	2	2	40	60	100
30		SBEC – II	20UCS4S02	Quantitative Aptitude – I	2	2	40	60	100
31	IV	NMEC – II		Non Major Elective Course – II	2	2	25	75	100
Total					**30**	**24**	**270**	**630**	**900**

SEMESTER V

32		Core – IX	20UCS5C09	Relational Database Management System	6	4	25	75	100
33		Core – X	20UCS5C10	.Net Programming	6	4	25	75	100
34	III	Core – XI	20UCS5C11	Computer Networks	6	4	25	75	100
35		Core Practical – V	20UCS5P05	.Net Programming Lab	3	4	40	60	100
36		Elective – I		Elective – I	6	4	25	75	100
37	IV	SBEC – III	20UCS5S03	Mobile App Development Lab	3	2	40	60	100

				Total	30	22	180	420	600
			SEMESTER VI						
38		Core – XII	20UCS6C12	PHP With MySQL	5	4	25	75	100
39		Core – XIII	20UCS6C13	Computer Graphics	5	4	25	75	100
40		Core – XIV	20UCS6C14	Java programming	5	4	25	75	100
41	III	Core Practical – VI	20UCS6P06	PHP With MySQL Lab	3	4	40	60	100
42		Core Practical – VII	20UCS6P07	Java Programming Lab	3	4	40	60	100
43		Elective – II	_	Elective – II	5	4	25	75	100
44		Project	20UCS6PR1	.Net/PHP/Android	2	6	40	60	100
45	IV	SBEC – IV	20UCS6S04	Quantitative Aptitude – II	2	2	40	60	100
46	V		20UCS6EX01	Extension Activities	-	1	-	-	-
			Total		30	33	260	540	800
			Grand Total		180	140	1320	3180	4500

Note

CBCS　– Choice Based Credit system

CIA　– Continuous Internal Assessment

ESE　– End of Semester Examinations

Elective Courses

Elective – I

Semester	Part	Course Code	Paper	Course Title
V	III	20UCS5E01	I	Mobile Computing
		20UCS5E02	II	Software Testing
		20UCS5E03	III	E-Commerce Technologies

Elective – II

Semester	Part	Course Code	Paper	Course Title
VI	III	20UCS6E04	I	Data Mining
		20UCS6E05	II	Cyber Safety
		20UCS6E06	III	Network Security

SBEC – Skill Based Elective Courses*								
Part	Semester	Title of the Paper	Hours		Credit	Maximum Marks		
			Lecture	Lab		CIA	ESE	Total
IV	II	Office Automation 20UCS2S01	-	2	2	40	60	100
	IV	Quantitative Aptitude – I 20UCS4S02	-	2	2	25	75	100
	V	Mobile App Development 20UCS5S03	-	2	2	40	60	100
	VI	Quantitative Aptitude – II 20UCS6S04	-	2	2	25	75	100

Non Major Elective Course – (NMEC)

Extra Disciplinary Subjects offered by the Department of Computer Science. The department can offer any one of the subjects to the other major subject students in each semester.

Part	Semester	Title of the Paper	Hours Lect.	Credit	CIA	ESE	Total
		NMEC – Non-Major Elective Courses					
IV	III	**NMEC I:** Basics of Computers 20UCS3N01	2	2	25	75	100
		NMEC I: System Administration and Maintenance - 20UCS3N02	2	2	25	75	100
	IV	**NMEC II:** Office Automation 20UCS4N03	2	2	25	75	100
		NMEC II: Basics of Internet 20UCS4N04	2	2	25	75	100

List of Extension Activities

1. National Cade Corps (NCC)
2. National Service Scheme (NSS)
3. Youth Red Cross (YRC)
4. Physical Education (PYE)
5. Eco Club (ECC)
6. Red Ribbon Club (RRC)
7. Women Empowerment Cell (WEC)

PROGRAMME SYLLABUS

Program: B.Sc. Computer Science				
Core – I		**Course Code:** 20UCS1C01		**Course Title:** Programming in Python
Semester I	**Hours/Week** 5	**Total Hours** 75	**Credits** 3	**Total Marks** 100

Course Objectives

1. To understand the nature of python programming.
2. To describe the core syntax and semantics of python programming language.
3. To infer the object-oriented programming concepts in python.
4. To understand why Python is a useful scripting language for developers.
5. To get practical knowledge of a popular programming language Python.

UNIT – I

Instant Hacking: The Basics: Numbers and Expressions – Variables – Statements – Getting Input from the User – Functions – Modules – Saving and Executing Your Programs – Strings.

UNIT – II

Lists and Tuples: Common Sequence Operations – Lists: Python's Workhorse – Tuples: Immutable Sequences. Working with Strings: String Formatting: The Long Version – String Methods.

UNIT – III

Conditionals, Loops, and Some Other Statements: More About Print and Import – Assignment Magic – Conditions and Conditional Statements – Loops.

UNIT – IV

Dictionaries: When Indices Won't Do: Dictionary Uses – Creating and using Dictionaries. Abstraction: Creating Your Own Functions – The Magic of Parameters: Keyword Parameters and Defaults – Scoping – Recursion. More Abstraction: The Magic of Objects – Classes and Types.

UNIT – V

Files and Stuff: Opening Files – The Basic File Methods. Database Support: The Python Database API – SQLite and PySQLite.

Text Book

1. Magnus Lie Hetland, "Beginning Python- From Novice to Professional", Apress Publishers, 2009, ISBN: 978-81-8489-092-1.

Reference Books

1. Dr. R. Nageswara Rao, "Core Python Programming", Dreamtech Press, Wiley Publication, Second edition, 2017, ISBN: 9789386052308
2. Mark Lutz, "Learning Python", O' Reilly, 2007, ISBN: 978-0-596-15806-4.
3. David Beazley and Brain K Jones, "Python Cookbook", O, Reilly, Third edition, 2013. ISBN: 978- 1449340377.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand and explain Python Programming.	K1 & K2
CO2	Interpret the fundamental Python syntax and semantics.	K2 & K3
CO3	Understand the concept of scripting and the contributions of scripting languages.	K3
CO4	Articulate the Object-Oriented Programming concepts used in python.	K3
CO5	Connect a Python program with a database.	K3 & K4

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO ╲ CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	M
CO2	S	M	S	S	M
CO3	S	S	S	S	M
CO4	S	M	S	M	S
CO5	S	S	S	S	S

S – Strong   **M – Medium**   **L – Low**

Program: B.Sc. Computer Science				
Core – II	**Course Code:** 20UCS1C02		**Course Title:** Digital Computer Fundamentals	
Semester I	**Hours/Week** 5	**Total Hours** 75	**Credits** 3	**Total Marks** 100

Course Objectives

1. Understand and describe the basics of various digital components.
2. Understand binary, hexadecimal and octal number systems and their arithmetic.
3. Understand how logic circuits and Boolean algebra forms as the basics of digital computer
4. Identify and illustrate basic organization of computer.
5. Knowledge in memory elements like RAM, ROM and Magnetic disk.

UNIT – I

Number Systems and Codes: Binary Number System – Binary-to-Decimal Conversion – Decimal-to-Binary Conversion – Octal Numbers – Hexadecimal Numbers – The ASCII Code – The Excess-3 Code – The Gray Code.

UNIT – II

Digital Logic: The Basic Gates – NOT, OR, AND – Universal Logic Gates – NOR, NAND – AND-OR-Invert Gates. Combinational Logic Circuits: Boolean Laws and Theorems – Sum-of-Products Method – Truth Table to Karnaugh Map – Pairs, Quads, and Octets – Karnaugh Simplification – Don't-care Conditions – Product-of-Sums Simplification.

UNIT – III

Data–Processing Circuits: 16-to-1 Multiplexer – 1-to-16 De-Multiplexer – BCD-to-Decimal Decoder – Decimal-to-BCD Encoder – Exclusive-OR Gates. Arithmetic Circuits: Binary Addition – Binary Subtraction – Unsigned Binary Numbers – Sign-magnitude Numbers – 2'S Complement Representation – 2'S Compliment Arithmetic.

UNIT – IV

Arithmetic Circuits: Arithmetic Building Blocks – The Adder – Subtractor. Flip-Flops: RS Flip-flops – Edge-Triggered D Flip-flops – Edge Triggered JK Flip-flops – JK Master-slave Flip-flops.

UNIT – V

Registers: Serial-In Serial-Out – Serial-In Parallel-Out – Parallel-In Serial-Out – Parallel-In Parallel-Out (54/74174). Memory: Introduction – Magnetic Memory – Optical Memory.

Text Book

1. Donald P Leach, Albert Paul Malvino and Goutam Saha, "Digital Principles and Applications," 8th Edition, TMH, 2006.

Reference Books

1. Morris Mano, "Digital Logic and Computer Design", 4th Edition, Pearson, 2008.
2. Thomas C Bartee, "Digital Computer Fundamentals", Sixth Edition,Tata McGraw-Hill, 1985.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe various number system and codes.	K1 & K2
CO2	Apply Boolean laws and rules to simplify simple expressions.	K2 & K3
CO3	Experiment combinational and sequential circuits.	K4 & K5
CO4	Identify and illustrate basic organization of computer.	K3
CO5	Illustrate the memory concepts, I/O devices and peripherals.	K3 & K4

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	S	M
CO2	M	M	S	S	M
CO3	S	S	S	S	M
CO4	S	M	S	M	S
CO5	S	S	M	S	M

S – Strong   **M – Medium**   **L – Low**

Program: B.Sc. Computer Science				
Core Practical – I		**Course Code:** 20UCS1P01		**Course Title:** Programming in Python Lab
Semester I	**Hours/Week** 3	**Total Hours** 45	**Credits** 2	**Total Marks** 100

Course Objectives

1. To train the students for the basics of coding and executing Python scripts.
2. To understand the various data structures available in Python programming language and apply them in solving computational problems.
3. To get practical knowledge of a popular programming language Python.

List of Practicals

1. Program to swap two numbers without taking a temporary variable.
2. Implement python script to read person's age from keyboard and display whether he is eligible for voting or not.
3. Write a program using a while loop that asks the user for a number, and prints a countdown from that number to zero.
4. To display elements of tuples in reverse order.
5. Program to add two matrices using lists.
6. Count words in a String using Dictionary.
7. Implement Python Script to check given string is palindrome or not.
8. Define a function max_of_three() that takes three numbers as arguments and returns the largest of them. Implement Python script to print factorial of a number using Recursion.
9. Find the area and perimeter of the circle using class and objects
10. Write Python script to copy file contents from one file to another.
11. Write a python program to perform various database operations (create, insert, delete, update).

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn to design and implement efficient programs using python.	K1 & K2
CO2	Improve Programming Skill in Python.	K3 & K4
CO3	Learn working with the new data types in python.	K4, K5 & K6
CO4	Possesses knowledge to implement in Python.	K4
CO5	Connect a Python program with a database.	K5 & K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	M
CO2	M	M	S	S	M
CO3	S	S	S	S	M
CO4	S	M	S	S	S
CO5	S	S	S	S	S

S – Strong　　　　**M – Medium**　　　　**L – Low**

Program: B.Sc. Computer Science				
Core – III		**Course Code:** 20UCS2C03		**Course Title:** Programming in C
Semester II	**Hours/Week** 5	**Total Hours** 75	**Credits** 3	**Total Marks** 100

Course Objectives

1. Learn the basic structure of C Programming.
2. To understand the nature of C programming.
3. To describe the core syntax and semantics of C programming language.
4. To help students to get the practical knowledge of a programming language.
5. Understand the decision making and branching statement in C.

UNIT – I

Overview of C: History of C – Importance of C – Basic Structure of C Programs. Constants, Variables and Data types: Character Set – C Tokens – Keywords and Identifiers – Constants – Variables – Data types – Declaration of Variables – Declaration of Storage Classes – Assigning Values to Variables – Defining Symbolic Constants. Operators and Expression: Types of Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Operators – Type Conversions in Expressions – Operator Precedence and Associativity. Managing Input and Output Operations: Reading and Writing a Character – Formatted Input and Output.

UNIT – II

Decision Making and Branching: Simple IF, IF-ELSE, Nesting of IF-ELSE, ELSE-IF ladder, Switch Statements – GOTO Statements. Decision Making and Looping: WHILE Statement – DO Statement – FOR Statement – Jumps in Loops. Arrays: Definition & Declaration – One Dimensional – Two Dimensional – Multi Dimensional Arrays – Dynamic Arrays.

UNIT – III

Character Arrays and Strings: Introduction – Declaring and Initializing String Variables – Reading Strings from Terminal – Writing Strings to Screen – String Handling Functions – Table of Strings. User – Defined Functions: Introduction – Need for User – Defined Function

– A Multi-Function Program – Elements of User-Defined Function – Definition of Functions – Return Values and their Types – Function Calls – Function Declaration – All Category of Functions – Nesting of Functions – Recursion – Passing Arrays to Functions – Passing Strings to Function.

UNIT – IV

Structures and Unions: Introduction – Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Structure Initialization – Copying and Comparing Structure Variables – Arrays of Structures – Arrays within Structures – Structures within Structures – Structures and Functions – Unions – Size of Structures – Bit Fields. Pointers: Introduction – Understanding Pointers – Accessing the Address of a Variable – Initializing of Pointer Variables. Chain of Pointers – Pointer Expressions – Pointers and Arrays – Pointers and Character Strings – Arrays of Pointers – Pointers as Function Arguments – Functions Returning Pointers – Pointers to Functions – Pointer and Structures.

UNIT – V

File Management: Introduction – Defining and Opening a File – Closing a File – Input/Output Operation on Files – Error Handling During I/O Operations – Random Access Files – Command Line Arguments.

Text Book

1. E. Balgurusamy, "Programming in ANSI C", 5th Edition, Tata McGraw Hill, New Delhi, 2010.

Reference Books

1. Herbert Schildt, "C: The complete Reference", 4th Edition, Tata Mc Graw Hill, 2003.
2. B.L. Juneja, "Programming in C", 1st Edition, Cengage Learning, 2012.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember and understand the concept of C.	K1 & K2
CO2	Apply the concept of Array, Function, String and Pointers.	K3
CO3	Analyze the concept of branching and looping statements.	K4
CO4	Develop solutions to problems using C programming.	K4 & K5
CO5	Ability to build C programming to solve real world problems.	K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	M
CO2	S	M	S	S	M
CO3	S	M	S	M	M
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S – Strong   **M – Medium**   **L – Low**

Program: B.Sc. Computer Science		
Core – IV	**Course Code:** 20UCS2C04	**Course Title:** Data Structures and Algorithms
Semester II	**Hours/Week** 4	**Total Hours** 60	**Credits** 3	**Total Marks** 100

Course Objectives

1. To have fundamental knowledge about data and the way it is stored.
2. To educate the concepts of fundamentals of writing algorithms and approach in problem solving.
3. To understand the concepts like stacks, queues, lists and its structures.
4. Knowing the concepts of Trees, Tree Traversals and Graphs
5. Develop some applications using data structures.

UNIT – I

Algorithms (Analysis and design): Problem Solving – Top-Down and Bottom-Up Approaches to Algorithm Design – Use of Algorithms in Problem Solving – Design, Implementation, Verification of Algorithm – Efficiency Analysis of Algorithms: Space, Time Complexity, and Frequency Count – Sample Algorithms: Exchange the Value of Two Variables – Summation of Set of Numbers – Decimal to Binary Conversion – Sorting – Factorial – Fibonacci – Finding a Largest Number in an Array – Reverse the Order of Elements in Array.

UNIT – II

Introduction: Definitions – Concepts – Overview – Implementation of Data Structures. Arrays: Definition – Terminology – One Dimensional Array – Multi Dimensional Array. Stacks: Introduction – Definition – Representation of Stacks – Operations on Stacks – Applications of Stack: Evaluation of Arithmetic Expression – Implementation of Recursion – Factorial Calculation.

UNIT – III

Queues: Introduction – Definition – Representation of Queues – Various Queue Structures: Circular Queue – De-queue – Priority Queue – Applications of Queues: CPU Scheduling.

Linked List: Definition – Single Linked List – Double Linked List – Circular Double Linked List – Applications: Sparse Matrix – Polynomial.

UNIT – IV

Trees: Terminologies – Definitions & Concepts – Representation of Binary Tree – Operations on Binary Tree – Types of Binary Trees: Expression Tree – Binary Search Tree – Heap Tree – Red Black Tree.

Graphs: Introduction – Graph terminologies – Representation of Graphs – Operations on Graphs – Applications of Graph: Shortest Path Problem – Minimum Spanning Tree: Kruskal and Prims Algorithm.

UNIT – V

Searching: Terminologies – Linear Search Techniques with – Array, Linked List, and Ordered List – Binary Search – Non Linear Search- Binary Tree Searching – Binary Search Tree Searching. Sorting: Terminologies – Sorting Techniques – Insertion Sort – Selection sort – Bubble sort – Quick sort – Merge sort.

Text Books

1. Sathish Jain, Shashi Singh, "Data Structure Made Simple", 1st Edition, BPB Publications, New Delhi, 2006.
2. Debasis Samanta, "Classic Data Structures", 2nd Edition, PHI Learning, New Delhi, 2009.

Reference Books

1. Aprita Gopal, "Magnifying Data Structures", 1st Edition, PHI Learning, New Delhi, 2010.
2. Chitra A & Rajan PT, "Data Structures", 2nd Edition, Vijay Nicole Publications, 2016.
3. Ellis Horowitz and Sartaj Sahni, "Fundamentals of Data Structure", Galgotia Publications, New Delhi, 1985.
4. Ellis Horowitz and Sartaj Sahni, "Fundamentals of Computer Algorithms", Galgotia Publications, New Delhi, 1985.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the representations of data and various algorithms.	K1 & K2
CO2	Analyze the complexity of different algorithms.	K3 & K4
CO3	Remember the concept of algorithms for searching, sorting and dynamic programming.	K1, K2 & K3
CO4	Adapting the algorithmic concepts and implement new ones.	K4 & K5
CO5	Apply appropriate algorithms and data structure for real time.	K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	S	M	S	M
CO3	S	M	S	M	M
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S – Strong   M – Medium   L – Low

Program: B.Sc. Computer Science					
Core Practical – II		**Course Code:** 20UCS2P02		**Course Title:** Data Structure using C Lab	
Semester II	**Hours/Week** 3	**Total Hours** 45	**Credits** 3	**Total Marks** 100	

Course Objectives

1. To impart adequate knowledge on the need of programming languages and problem solving techniques.
2. To develop an in-depth understanding of functional and logical concepts of C Programming.
3. To understand the various data structures and apply them in solving computational problems
4. To get practical knowledge of a popular programming language C.

List of Practicals

1. Implement Push and Pop Operations of a Stack using Array.
2. Write a program to perform factorial calculation using recursion.
3. Implement Add and Delete Operations on Queue using Pointer.
4. Implement Add and Delete Operations on Circular Queue.
5. Write a Program to convert an Infix Expression to Postfix Expression using Arrays.
6. Write a Program to add Two Polynomials using Pointers.
7. Perform Tree Traversals for a Binary Tree using Recursion.
8. Write a program to perform Binary Search.
9. Sort the given list of numbers using Heap Sort.
10. Sort the given list of numbers using Quick Sort.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Improve an ability to develop programs in C.	K1 & K2
CO2	Learn to implement various data structures using arrays and pointers in C language.	K3 & K4
CO3	Evaluating infix and postfix expressions by using C.	K5
CO4	Possess knowledge to solve polynomial problems in C language.	K3, K4 & K5
CO5	Enable to implement searching and sorting problems in C.	K3, K4 & K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	M	M	S	S	M
CO3	S	S	S	S	M
CO4	S	M	S	S	S
CO5	S	S	S	S	S

S – Strong   M – Medium   L – Low

Program: B.Sc. Computer Science				
SBEC – I		**Course Code:** 20UCS2S01	**Course Title:** Office Automation Lab	
Semester II	**Hours/Week** 2	**Total Hours** 30	**Credits** 2	**Total Marks** 100

Course Objectives

1. Give students an in-depth understanding of why MS Office package.

2. Provide hands-on use of Microsoft Office applications Word, Excel and PowerPoint.

3. Create a new document and format a document, prepare how to create bio-data, create how to insert a table in document and create mailing labels using mail merge.

4. Create a database in Excel and sort the data, prepare mark list for a student, Pay bill preparation, Invoice report and generate a graph for the given data.

5. Create presentation in PowerPoint for a seminar, prepare organization charts, and prepare charts to display percentage of marks in each semester for all students.

MS-Word

1. Text Manipulation: Write a paragraph about your institution and Change the font size and type, Spell check, Aligning and justification of Text.

2. Find and Replace: Write a paragraph about yourself and do the following.
   Find and Replace - Use Numbering Bullets, Footer and Headers.

3. Tables and manipulation: Creation, Insertion, Deletion (Columns and Rows).
   Create a mark sheet.

4. Mail Merge: Prepare an invitation to invite your friends to your birthday party. Prepare at least five letters.

MS-Excel

1. Mark list preparation for a student using Data sorting-Ascending and Descending (both numbers and alphabets).

2. Individual Payroll preparation.

3. Invoice Report preparation.

4. Drawing Charts. Take your own table.

MS-Powerpoint

1. Create a slide show presentation for a seminar using Tables and Organization Charts.

2. Create a slide show presentation to display percentage of marks in each semester for all students.

    a) Use bar chart (X-axis: Semester, Y-axis: % marks).

    b) Use different presentation template different transition effect for each slide.

MS-Access

1. Creating Table using different methods.

2. Generating reports.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Create a document for various purposes, edit and format the document according to the need.	K3
CO2	Gain knowledge to create spreadsheets and use features like formulas and charts creation, fill series, sorting and filtering.	K3
CO3	Prepare PowerPoint presentation for their seminar including slide show, effects, graphs, etc.	K4
CO4	Enable the students to create database and handle the query.	K5 & K6
CO5	Learn to generate reports using MS ACCESS.	K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	L
CO2	S	S	S	L	L
CO3	S	S	S	M	M
CO4	S	S	S	M	S
CO5	S	M	S	M	M

S – Strong   **M – Medium**   **L – Low**

Program: B.Sc. Computer Science					
Core – V		**Course Code:** 20UCS3C05		**Course Title:** Programming in C++	
Semester III	**Hours/Week** 5	**Total Hours** 75	**Credits** 3	**Total Marks** 100	

Course Objectives

1. To understand the key concept of Object Oriented Programming.
2. To familiarize the students with language environment and to develop the programs for solving the problems using function overloading, constructors and object.
3. To develop student's programming skill to write programs in C++ using classes and objects.
4. To familiar with the concepts of Constructors, Polymorphism and Inheritance.

UNIT – I

Object-Oriented Programming: Principles – Benefits of OOP – Application of OOP – Tokens, Expression and Control Structures: Tokens – Keywords – Identifiers and Constants – Data Types – Constants – Variables – Operators – Manipulators – Expressions – Control Structure.

UNIT – II

Functions – Prototyping – Call by Reference – Return by Reference – Inline Functions – Default Arguments – const Arguments – Function Overloading – Friend and Virtual Functions, Classes and Objects – Class – Member Functions – Arrays with in a Class – Memory Allocation for Objects – Static Data Members – Static Member Functions – Arrays of Objects – Objects as Function Arguments – Friendly Functions – Returning Objects – const Member Functions – Pointers to Members, Constructors and Destructors.

UNIT – III

Operator Overloading and Type Conversions, Inheritance: Extending Classes – Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Hierarchical

Inheritance – Hybrid Inheritance – Virtual Base Classes – Abstract Classes, Pointers, Virtual Functions and Polymorphism. Pointers: Pointers to Objects –this Pointer – Pointers to Derived Classes – Virtual Functions – Pure Virtual Functions.

UNIT – IV

Managing I/O Operations: C++ Streams – C++ Stream Classes – Unformatted I/O and Formatted I/O Operations – Managing Output with Manipulators, Working with Files – Classes for File Stream Operations – Opening and Closing a File – Detecting End-of-File – File Pointers and their Manipulators – Sequential I/O Operations – Updating a File – Error Handling during File Operations – Command Line Arguments.

UNIT – V

Templates: Class Templates – Class Templates with Multiple Parameters – Function Templates – Function Templates with Multiple Parameters – Overloading of Template Functions – Member Function Templates – Non-Type Template Arguments, Exception Handling: Basics – Exception Handling Mechanism – Throwing Mechanism – Catching Mechanism – Rethrowing an Exception – Specifying Exceptions.

Text Book

1. E. Balagurusamy, "Object Oriented Programming with C++", 5th Edition, Tate McGraw Hill Publication Ltd., New Delhi, 2011.

Reference Books

1. M. T. Somashekara, "Object Oriented programming with C++", 2nd Edition, Prentice Hall of India Learning Limited, 2012.
2. Behrouz A.Forouzan, "A Structured Approach Using C++", 2nd Edition, Cengage Learning, 2003.
3. H. Schildt, "C++, "The Complete Reference", 4th Edition, TMH Edition, 2003.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Implement the concepts of object oriented programming.	K3
CO2	Apply string functions to perform operator overloading.	K3 & K4
CO3	Demonstrate virtual functions and inheritance.	K4
CO4	Implement files and command line arguments.	K4 & K5
CO5	Build real world applications in C++.	K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	S	M	M	S	M
CO3	S	S	S	M	M
CO4	S	M	S	M	M
CO5	S	S	S	S	S

S – Strong   M – Medium   L – Low

Program: B.Sc. Computer Science		
Core – VI	**Course Code:** 20UCS3C06	**Course Title:** Operating System

Semester III	Hours/Week 5	Total Hours 75	Credits 3	Total Marks 100

Course Objectives

1. Study the basic concepts and structure of operating systems.
2. Learn about Processes, Threads and Inter process communication.
3. Learn various Scheduling algorithms and memory management schemes.
4. Understand the principles of concurrency and Deadlocks.
5. Study I/O management and File systems.

UNIT – I

Introduction – History of Operating System – Different Kinds of Operating System – Operation System Concepts – System Calls – Operating System Structure.

UNIT – II

Processes and Threads: Processes – Threads – Thread Model and Usage – Inter Process Communication.

UNIT – III

Scheduling – Memory Management: Memory Abstraction – Virtual Memory – Page Replacement Algorithms.

UNIT – IV

Deadlocks: Resources – Introduction to Deadlocks – Deadlock Detection and Recovery – Deadlocks Avoidance – Deadlock Prevention. Multiple Processor System: Multiprocessors – Multi Computers.

UNIT – V

Input/Output: Principles of I/O Hardware – Principles of I/O Software. Files Systems: Files – Directories – Files Systems Implementation – File System Management and Optimization.

Text Book

1. Andrew S. Tanenbaum, "Modern Operating Systems", 2nd Edition, PHI private Limited, New Delhi, 2008.

Reference Books

1. William Stallings, "Operating Systems – Internals & Design Principles", 5th Edition, Prentice – Hall of India Private Ltd., New Delhi, 2004.

2. Sridhar Vaidyanathan, "Operating System", 1st Edition, Vijay Nicole Publications, 2014.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Define operating system and its types.	K1
CO2	Understand the role of operating system as a CPU scheduler.	K2
CO3	Apply the process management through process synchronization and deadlock.	K3
CO4	Build skills to apply virtual memory and memory scheduling.	K3
CO5	Develop problem solving techniques for disk scheduling and file management.	K3

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	S	M	M	M	M
CO3	S	S	S	M	S
CO4	S	M	S	S	S
CO5	S	S	S	M	S

S – Strong   **M – Medium**   **L – Low**

Program: B.Sc. Computer Science				
Core Practical – III		**Course Code:** 20UCS3P03		**Course Title:** Programming in C++ Lab
Semester III	**Hours/Week** 3	**Total Hours** 45	**Credits** 3	**Total Marks** 100

Course Objectives

1. To impart adequate knowledge on real world problem solving techniques in C++.

2. To develop an in-depth understanding of functional and logical concepts of C++.

3. To develop the programs for solving the problems using function overloading, constructors and object.

4. Provides methods and technologies involved in building complex software.

List of Practicals

1. Write a C++ program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable. Write member functions ADD(),SUB(), MUL(), DIV() to perform addition, subtraction, multiplication, division respectively. Write a member function to get and display values.

2. Write a C++ program to create a class FLOAT that contains one float data member. Overload all the four Arithmetic operators so that they operate on the object FLOAT.

3. Write a C++ program to create a class STRING. Write a Member Function to initialize, get and display stings. Overload the operators ++ and = = to concatenate two Strings and to compare two strings respectively.

4. Write a C++ program to create class, which consists of EMPLOYEE Detail like E_Number, E_Name, Department, Basic, Salary, Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade.

5. Write a C++ program to create a class SHAPE which consists of two VIRTUAL FUNCTIONS Calculate_Area() and Calculate_Perimeter() to calculate area and perimeter of various figures. Derive three classes SQUARE, RECTANGLE, TRIANGE from class Shape and Calculate Area and Perimeter of each class separately and display the result.

6. Write a C++ program using Function Overloading to read two Matrices of different Data Types such as integers and floating point numbers. Find out the sum of the above two matrices separately and display the sum of these arrays individually.

7. Write a program to convert an Infix Expression to Postfix Expression using Arrays.

8. Write a C++ program to create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the STACK. Write a member function PUSH() to insert an element and member function POP() to delete an element. Check for overflow and underflow conditions.

9. Write a C++ program to check whether the given string is a palindrome or not using Pointers.

10. Write a C++ program to merge two files into a single file

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Implement the concepts of object oriented programming.	K3
CO2	Apply string functions to perform operator overloading.	K3
CO3	Demonstrate Function Overloading and inheritance.	K4
CO4	Ability to implement data structures with C++	K4 & K5
CO5	Implement files and command line arguments.	K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	M
CO2	S	M	S	M	M
CO3	S	M	S	M	M
CO4	S	S	S	S	S
CO5	S	S	S	M	S

S – Strong　　　　**M – Medium**　　　　**L – Low**

Program: B.Sc. Computer Science					
Core – VII		**Course Code:** 20UCS4C07		**Course Title:** Web Technology	
Semester IV	**Hours/Week** 4	**Total Hours** 60		**Credits** 3	**Total Marks** 100

Course Objectives

1. Course demonstrates an in-depth understanding of the tools and technologies necessary for business application design and development.
2. Coaches students to design a static and dynamic webpages.
3. To implement the concepts like scripting concepts and Cascading Style Sheets.
4. It educates students to build a website with rich internet applications.
5. It covers client side scripting like HTML, JavaScript and server side scripting like servlets, JSPs and web servers and database interfacing.

UNIT – I

Internet Principles: Introduction to Internet – Client Server Model – Protocol – Internet IP Address-Domain Name – Internet Services – Electronic Mail – World Wide Web – Internet Security – E-Commerce – EDI.

UNIT – II

Introduction to HTML: HTML Tags – HTML Documents – Headings – Hyperlinks using Anchor Tag-Formatting Characters – Font – Images and Pictures – Listing – Tables in HTML Tags – Frameset Definition – Fame Definition – Nested Framesets – HTML Forms – Elements of a Form Use Tags.

UNIT – III

JavaScript: Data Types – Variables – Operators – Conditional Statements using Javascript – Document Objects – Image Objects using Javascript – Forms and Elements – Event Handling – Browser Object – Submit Event and Data Validation – Parseint() Function – ParseFloat() Function – Recursive Function.

UNIT – IV

Server Side Script with JSP: Client Responsibilities – Server Responsibilities – Introduction to JSP – JSP Architecture – JSP Servers – JSP Tags – Request Object – Response Object – JSP Page.

UNIT – V

JSP with JDBC: Creating ODBC Data Source Name – Introduction to JDBC – Telephone Directory with JDBC – Servlet Environment and Role – Protocol Support – HTML Support – Servlet Life Cycle – HTML to Servlet Communication.

Text Book

1. C. Xavier, "Web Technology and Design", 1st Edition, New Age International, 2011.

Reference Book

1. H.M. Deitel, P.J. Deitel, "Internet and World Wide Web - How to Program", 3rd Edition, Pearson Publication, 2006.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Outline the history of the web, and technologies that makes the web pages and publishing them.	K1
CO2	Design a static webpage by applying HTML elements.	K2 & K3
CO3	Apply CSS concepts for designing HTML web pages.	K3
CO4	Implement a webpage with database connectivity using Java.	K3 & K4
CO5	Make the web pages more dynamic and interactive.	K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	M
CO2	S	S	S	S	M
CO3	S	S	S	M	S
CO4	S	M	S	S	S
CO5	S	S	S	M	M

S – Strong   **M – Medium**   **L – Low**

Program: B.Sc. Computer Science		
Core – VIII	**Course Code:** 20UCS4C08	**Course Title:** Software Engineering

Semester	Hours/Week	Total Hours	Credits	Total Marks
IV	4	60	3	100

Course Objectives

1. Understanding of software requirements and the SRS documents.
2. Understanding of the role of project management including planning, scheduling, risk management, etc.
3. Describe different models and understanding of different software architectural styles.
4. Understanding on quality control and how to ensure good quality software.
5. Be successful professionals in the field with firm fundamental knowledge of software engineering.
6. Apply their foundations in software engineering to adapt to readily changing environments using the appropriate theory, principles and processes.

UNIT – I

Introduction – Software Engineering Discipline – Evolution and Impact – Programs Vs Software Products. Software Life Cycle Models: Use of a Life Cycle Models – Classical Waterfall Model – Iterative Waterfall Model – Prototyping Model – Evolutionary Model – Spiral Model. Software Project Management: Responsibilities of a Software Project Manager – Project Planning – Metrics for Project Size Estimation – Project Estimation Techniques – Risk Management.

UNIT – II

Requirements Analysis and Specification: Requirements Gathering and Analysis – Software Requirements Specification (SRS) – Formal System Development Techniques. Software Design: Characteristics of a Good Software Design – Cohesion and Coupling – Neat Arrangement – Software Design Approaches.

UNIT – III

Function-Oriented Software Design: Overview of SA/SD Methodology – Structured Analysis – Data Flow Diagrams (DFDs). Object Modeling Using UML: Overview of Object-Oriented Concepts – UML Diagrams – Use Case Model – Class Diagrams – Interaction Diagrams – Activity Diagrams – State Chart Diagram.

UNIT – IV

User Interface Design: Characteristics of a Good User Interface – Basic Concepts – Types of User Interfaces – Component-Based GUI Development; Coding and Testing: Coding – Testing – UNIT Testing – Black-Box Testing – White-Box Testing – Debugging – Integration Testing – System Testing.

UNIT – V

Software Reliability and Quality Management: Software Reliability – Statistical Testing – Software Quality – Software Quality Management System – ISO 9000. Computer Aided Software Engineering: CASE Environment – CASE support in Software Life Cycle – Characteristics of CASE Tools – Architecture of a CASE Environment. Software Maintenance: Characteristics of Software Maintenance – Software Reverse Engineering – Software Maintenance Process Models – Estimation of Maintenance Cost. Software Reuse: Issues in any Reuse Program – Reuse Approach.

Text Book

1. Rajib Mall, "Fundamentals of Software Engineering", 3rd Edition, Prentice Hall of India Private Limited, 2008.

Reference Books

1. Roger S.Pressman and Bruce R.Maxim, "Software Engineering: A Practitioner's Approach", 8th Edition, McGraw Hill Higher Education, 2015.
2. Rajib Mall, "Fundamentals of Software Engineering", 4th Edition, Prentice Hall of India Private Limited, 2014.
3. Richard Fairley, "Software Engineering Concepts", TMGH Publications, 2004.
4. Hans van Vliet, "Software Engineering: Principles and Practice", Third Edition, Wiley, 2010.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Apply the software engineering life cycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment.	K3 & K4
CO2	Ability to work in one or more significant application domains.	K3 & K4
CO3	Work as an individual and as part of a multidisciplinary team to develop and deliver quality software.	K4, K5 & K6
CO4	Ability to work as an effective member or leader of software engineering teams.	K4
CO5	Ability to understand and meet ethical standards and legal responsibilities.	K5 & K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	M
CO2	S	S	S	S	M
CO3	S	S	S	M	S
CO4	S	M	S	S	S
CO5	S	S	S	M	M

S – Strong   M – Medium   L – Low

Program: B.Sc. Computer Science				
Core Practical – IV		**Course Code:** 20UCS4P04		**Course Title:** Web Technology Lab
Semester IV	**Hours/Week** 2	**Total Hours** 30	**Credits** 3	**Total Marks** 100

Course Objectives

1. To develop an ability to design and implement static and dynamic website.
2. Enable the students to create HTML forms and validate them with Java script.
3. To enable the students to design and develop the Web applications in open source environment.
4. To make the students work with web pages and style sheets effectively.
5. To enable the students to design the web pages with java script.

List of Practicals

1. Create a form having number of elements (Textboxes, Radio buttons, Checkboxes, and so on). Write JavaScript code to count the number of elements in a form.
2. Create a HTML form that has number of Textboxes. When the form runs in the Browser fill the textboxes with data. Write JavaScript code that verifies that all textboxes has been filled. If a textboxes has been left empty, popup an alert indicating which textbox has been left empty.
3. Develop a HTML Form, which accepts any Mathematical expression. Write JavaScript code to Evaluates the expression and Displays the result.
4. Create a page with dynamic effects. Write the code to include layers and basic animation.
5. Write a JavaScript code to find the sum of N natural Numbers. (Use user defined function)
6. Write a JavaScript code block using arrays and generate the current date in words, this should include the day, month and year.
7. Create a form for Student information. Write JavaScript code to find Total, Average, Result and Grade.
8. Create a form for Employee information. Write JavaScript code to find DA, HRA, PF, TAX, Gross pay, Deduction and Net pay.
9. Create a form consists of a two Multiple choice lists and one single choice list

a. The first multiple choice list, displays the Major dishes available.

b. The second multiple choice list, displays the Starters available.

c. The single choice list, displays the Soft drinks available.

10. Create a web page using two image files, which switch between one another as the mouse pointer moves over the image. Use the on Mouse Over and on Mouse Out event handlers.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand modern protocols and systems used on Web, such as HTML.	K2
CO2	Select and apply markup languages for processing combine multiple web technologies to create advanced web pages.	K3
CO3	Apply Web Technologies to design dynamic webpages.	K3 & K4
CO4	Enable to write well-structured, easily maintained JavaScript.	K4 & K5
CO5	Create Web forms and perform Manipulations with Scripting.	K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	M
CO2	S	M	S	M	M
CO3	S	M	S	S	M
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S – Strong   **M – Medium**   **L – Low**

Program: B.Sc. Computer Science				
SBEC – II		**Course Code:** 20UCS4S02	**Course Title:** Quantitative Aptitude – I	
Semester IV	**Hours/Week** 2	**Total Hours** 30	**Credits** 2	**Total Marks** 100

Course Objectives

1. Students will be able to recognize and understand the meaning of targeted grammatical structures in written and spoken form which includes Tense, Sentence Pattern, Articles and Prepositions.

2. The objectives of the Soft Skills are to give each student a realistic perspective of work expectations including interview skills like GD, gestures and other interpersonal skills.

3. To enhance the problem-solving skills, to improve the basic mathematical skills and to help students who are preparing for any type of competitive examinations.

4. Verbal reasoning is intended to test a student ability to understand the potential for critical thinking, problem-solving and ultimately intelligence.

UNIT – I

Communication: Tense – Sentence Pattern - Articles – Prepositions.

UNIT – II

Soft Skill: Self Introduction - Interpersonal Skills – Soft Skills Training – Group Discussion – Importance of GD – Types of GD – Movements and Gestures to be Avoided in a GD.

UNIT – III

Numerical Aptitude: Problems on Numbers – Problems on Ages – Percentage.

UNIT – IV

Numerical Aptitude: Profit and Loss – Ratio & Proportion – Time & Work.

UNIT – V

Verbal Reasoning: Letter Series – Number Series – Coding and Decoding.

Text Books

1. Hari Mohan Prasad & Uma Rani Sinha, "Objective English for Competitive Examinations", Tata McGraw Hill Education Private Ltd., 2016. (Unit – I)

2. M. S. Rao, "Soft Skills Enhancing Employability-Connecting Campus with Corporate", IK International Publishing House, New Delhi, 2010. (Unit – II)

3. Alex. K, "Soft Skills-Know Yourself and Know the World", S.Chand Company Ltd., 2011. (Unit – II)

4. R.S. Aggarwal, "Quantitative Aptitude", S. Chand Company Limited, 2010. (Unit – III & IV)

5. R.S. Agarwal, "A Modern Approach to Verbal Reasoning (Fully Solved)" –Revised Edition, S. Chand Company Limited, New Delhi, 2012. (Unit – V)

Reference Books

1. Dr. Rashmi Singh, "Essential English for Competitive Examinations", 2nd Edition, Disha Publications, 2019.

2. Disha Experts, "Rapid Quantitative Aptitude - With Shortcuts & Tricks for Competitive Exams", Disha Publications, 2018.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Students can communicate with simple English without any grammatical error.	K3
CO2	Soft Skill improves students work life skills where they can participate in interview in effective manner.	K3
CO3	Students will be expected to actively do mathematics such as Problems on numbers, Problems on Ages, Percentage, Profit and loss, Ratio & Proportion and Time & Work.	K4
CO4	Students have the ability to solve coding decoding, letter series and number series.	K4

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	L
CO2	S	S	S	L	L
CO3	S	S	S	M	M
CO4	S	S	S	L	M

S – Strong   **M – Medium**   **L – Low**

Program: B.Sc. Computer Science				
NMEC – I		**Course Code:** 20UCS3N01	**Course Title:** Basics of Computer	
Semester III	**Hours/Week** 2	**Total Hours** 30	**Credits** 2	**Total Marks** 100

Course Objectives

1. Understand the basic of computer such as types, characteristics and generations.
2. Acquire knowledge about number system.
3. Know about Input and Output devices of computer
4. Learn basic concept of operation system, database, programming languages and office packages.

UNIT – I

Introduction to Computer: Introduction – Types of computers – Characteristics of Computers. Generations of Computers: First Generation – Second Generation – Third Generation – Fourth Generation – Fifth Generation. Classification of Digital Computers: Introduction – Microcomputers – Personal Computer – Portable Computers – Mini Computers – Super Computers – Main Frames.

UNIT – II

Number System: Introduction – Decimal Number System – Binary Number System – Binary-Decimal Conversion – Decimal Binary Conversion – Binary Addition – Binary Subtraction – Complements – 9's Complement – 10's Complement – 1's Complements – 2's Complements – BCD – Bits, Bytes, Words – Octal – Hexadecimal Number System.

UNIT – III

Anatomy of Digital Computer: Functions and Components of Computer – Central Processing UNIT – Control UNIT – Arithmetic – Logic UNIT – Memory – Registers – Addresses. Memory UNITs: RAM, ROM, PROM, EPROM, EEPROM, And Flash Memory.

UNIT – IV

Input Devices: Introduction – Keyboard – Mouse – Types of Mice – Connections – Mouse Pad – Trackball – joystick – Digitizing Tablet – Scanners – Digital Camera – MICR – OCR – OMR – Bar Code Reader – Speech Input Device- Touch Screen – Touch Pad – Light Pen. Output Devices: Introduction – Monitor – Classification of Monitors – Monochrome – Gray Scale – Color – Digital Monitor – Analog Monitor – Characteristics of Monitor – Printers.

UNIT – V

Computer Software: Introduction – Operating System – Utilities – Compiler and Interpreters – Word Processor – Spreadsheets – Presentation Graphics – DBMS – Programming Languages: Machine Language – Assembly Language – High Level Language – Types of High Level Language. Data Processing: Data VS Information – File Processing – Sequential File Processing – Direct Access File Processing.

Text Book

1. Alexis Leon and Mathews Leon, "Fundamentals of Computer Science and Communication Engineering", Leon Tech world, 1998.

Reference Books

1. B Ram and Sanjay Kumar, "Computer Fundamentals", 5th Edition, New Age International Publishers, 2014.
2. Pradeep K Sinha, Priti Sinha, "Computer Fundamentals", BPB Publications, 2004.
3. Anita Goel, "Computer Fundamentals", 1st Edition, Pearson Education India, 2010.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Bridge the fundamental concepts of computers with the present level of knowledge of the students.	K2
CO2	Familiarize the concept of operating systems, programming languages, peripheral devices, networking, multimedia and internet.	K2
CO3	Understand binary, hexadecimal and octal number systems and their arithmetic.	K2
CO4	Understand about the concept of memory classifications.	K2
CO5	Aware of Input and Output devices.	K3 & K4

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	L
CO2	S	M	S	L	L
CO3	S	M	S	M	M
CO4	S	L	S	L	M
CO5	S	M	S	M	M

S – Strong   M – Medium   L – Low

Program: B.Sc. Computer Science		
NMEC – I	**Course Code:** 20UCS3N02	**Course Title:** System Administration and Maintenance

Semester	Hours/Week	Total Hours	Credits	Total Marks
III	2	30	2	100

Course Objectives

1. Students will learn and apply basic concepts and methodologies of System Administration and Security.
2. Able to install OS and troubleshooting.
3. Understanding the fundamentals of operating system functionalities.
4. Learn about basics of network and fundamental security of network.

UNIT – I

Introduction to Personal Computer: Computer System – Purposes & Characteristics of Cases – Power Supplies – Internal Components – Ports – Cables – Input devices – Output devices. Safe Lab Procedures and Tool Use: Safe Working Conditions and Procedures – Tools and Software used with PC components.

UNIT – II

Computer Assembly: Open Case – Install Power Supply – Attach Components to Motherboard - Installation: Motherboard – Internal Drives – Drives in External Bayes - Adapter Cards. Internal Cables Connections –Reattach Side Panels – Connection of External Cables – Boot the Computer. Preventive Maintenance and Troubleshooting: Purpose of Preventing Maintenance – Steps of Troubleshooting Process - Data Protection Purposes.

UNIT – III

Fundamental Operating System: Purposes – Characteristics of Modern Operating Systems – Concepts – Comparisons, Limitations, and Compatibilities – Determination of Operating System Based on Customer Needs – Installation of Operating System – Navigate a GUI (Windows) – Common Preventive Maintenance Techniques – Troubleshoot.

UNIT – IV

Fundamental Laptops and Portable Devices: Common Uses – Components of Laptop – Comparison of the Components of Desktop and Laptops – Configure Laptops – Mobile Phone Standards – Preventive Maintenance Techniques – Troubleshoot Laptop and Portable Devices. Fundamental Printers and Scanners: Types of Printers and Scanners – Installation and Configuration Process of Printers and Scanners – Preventive Maintenance Techniques – Troubleshoot.

UNIT – V

Fundamental Networks: Principles – Types – Concepts and Technologies – Physical Components – LAN Topologies and Architectures – Standard Organizations – Ethernet Standards – OSI and TCP/IP Models – Configuration of NIC and Modem – Establishing Connectivity – Preventive Maintenance Techniques – Troubleshoot. Fundamental Security: Security Threats – Security Procedures – Preventive Maintenance Techniques – Troubleshoot Security.

Text Book

1. David Anfinson & Ken Quamme, "IT Essentials: PC Hardware and Software Companion Guide", 3rd Edition, Pearson Publications, 2008.

Reference Book

1. Quentin Docter, Emmett Dulaneyand Toby Skandier, "CompTIA A+ Complete Review Guide: Exam 220-901, Exam 220 – 902", 3rd Edition, Wiley Publications, 2015.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Use multiple computer system platforms, and understand the advantages of each.	K2 & K3
CO2	Install and administer network services.	K2 & K3
CO3	Protect and secure users' information on computer systems.	K3
CO4	Use the command line interface for system administration.	K3
CO5	Install and manage disks and file systems.	K3

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	L
CO2	S	M	S	L	L
CO3	S	S	S	M	M
CO4	S	M	S	L	M
CO5	S	S	S	M	M

S – Strong   **M – Medium**   **L – Low**

Program: B.Sc. Computer Science				
NMEC – II		**Course Code:** 20UCS4N03		**Course Title:** Office Automation
Semester IV	**Hours/Week** 2	**Total Hours** 30	**Credits** 2	**Total Marks** 100

Course Objectives

1. Give students an in-depth understanding of why MS Office package.

2. Provide hands-on use of Microsoft Office applications Word, Excel and PowerPoint.

3. Create a new document and format a document, prepare how to create bio-data, create how to insert a table in document and create mailing labels using mail merge.

4. Create a database in Excel and sort the data, prepare mark list for a student, pay bill preparation, invoice report and generate a graph for the given data.

5. Create presentation in PowerPoint for a seminar, prepare organization charts, and prepare charts to display percentage of marks in each semester for all students.

UNIT – I

Exploring word 2007: Working in the Word Environment – Opening, Moving Around in, and Closing a Document – Displaying Different Views of a Document – Creating and Saving a Document – Previewing and Printing a Document.

UNIT – II

Editing and Proofreading Documents: Make Changes to a Document – Insert Saved Text – Find the Most Appropriate word – Reorganize a Document Outline – Find and Replace Text.

UNIT – III

Error Corrections: Correct Spelling and Grammatical Errors – Finalize a Document – Changing the Look Quickly Format Text and Paragraphs – Manually Change the Look of Characters. – Manually Change the Look of Paragraphs.

UNIT – IV

Bulleted and Numbered Lists: Create and Modify Lists – Presenting Information in Columns. Creating Table: Create a Tabular List – Present Information in a Table.

UNIT – V

Formatting a Table: Format Table Information – Perform Calculation in a Table – Use a Table to Control Page Layout.

Text Book

1. Joyce Cox and Team, "Step by Step 2007 Microsoft Office System", PHI Learning Private limited, New Delhi, 2009.

Reference Book

1. Peter Weverka, "MS Office 2013 All-in-One for Dummies", 1st Edition, Wiley Publications, 2013.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Create a document for various purposes, edit and format the document according to the need.	K3
CO2	Gain knowledge to create spreadsheets and use features like formulas and charts creation, fill series, sorting and filtering.	K3
CO3	Student can prepare Power Point presentation for their seminar including slide show, effects, graphs, etc.	K4
CO4	Enable the students to create database and handle the query	K5 & K6
CO5	Learn to generate reports using MS Access.	K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	L
CO2	S	S	S	L	L
CO3	S	S	S	M	M
CO4	S	S	S	M	S
CO5	S	M	S	M	M

S – Strong **M – Medium** **L – Low**

Program: B.Sc. Computer Science		
NMEC – II	**Course Code:** 20UCS4N04	**Course Title:** Basics of Internet
Semester IV	**Hours/Week** 2	**Total Hours** 30

Semester IV	**Hours/Week** 2	**Total Hours** 30	**Credits** 2	**Total Marks** 100

Course Objectives

1. Build an understanding of the fundamental concepts of computer networking.
2. Familiarize the student with the basic taxonomy and terminology of the computer networking area.
3. Introduce the student to advanced networking concepts, preparing the student for advanced courses in computer networking.
4. Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

UNIT – I

Introduction to The Internet: Computer in Business – Networking – Internet - E-mail – Resource Sharing – Gopher – World Wide Web – Telnet – Bulletin Board Service – Wide Area Information Service.

UNIT – II

Internet Technologies: Modem – Internet Addressing – Physical Connections – Telephone Lines – Internet Browsers – Internet Explorer – Netscape Navigator.

UNIT – III

Introduction to HTML: Designing a Home Page – HTML Documents – Anchor Tag – Hyper Links.

UNIT – IV

Traditional Text and Formatting – Tables - Images – Frames.

UNIT – V

Case Study: Online Passport – Online Gas Services – Online Train Reservation – Tamilnadu Government Services.

Text Books

1. C Xavier, "World Wide Web with HTML", Tata McGraw Hill Education, 2000.
2. H.M.Deital, P.J. Deital,"Internet and World Wide Web – How to Program", 4th Edition "PHI Learning, 2009.

Reference Websites

1. http://www.ebharatgas.com/
2. http://passportindia.gov.in/
3. https://www.irctc.co.in
4. http://www.tn.gov.in/

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Independently understand basic computer network technology.	K3
CO2	Understand and explain Data Communications System and its components.	K3
CO3	Identify the different types of network topologies and protocols.	K4
CO4	Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.	K4
CO5	Identify the different types of network devices and their functions within a network.	K4

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO / CO	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	L
CO2	S	S	S	L	L
CO3	S	S	S	M	M
CO4	S	M	S	M	M
CO5	S	M	S	M	M

S – Strong   **M – Medium**   **L – Low**