KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE – 641 029

DEPARTMENT OF COMPUTER TECHNOLOGY

CURRICULUM AND SCHEME OF EXAMINATIONS (CBCS)

(2025 – 2026 and Onwards)

KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

Coimbatore – 641 029

DEPARTMENT OF COMPUTER TECHNOLOGY

Vision:

- ✓ The Department of Computer Technology strives to provide a rigorous intellectual environment that fosters the search for new knowledge in a highly dynamic computing-centric society and changing students into critical thinkers and lifelong learners who can apply their knowledge and skills for the betterment of society.

Mission:

- ✓ Provide a current, comprehensive, and collaborative student-centered learning environment for Computer Technologies and professional values associated with discipline. Prepare students for professional careers. Promote the discovery, dissemination and application of computing knowledge.

PROGRAMME OUTCOMES (PO)

PO1 Enhance the skills and new computing technologies through practical and theoretical knowledge of computer science and software engineering.

PO2 Pursue higher education or practice as computing professionals to earn a living and to contribute to the economic development of the region, state and nation.

PO3 Apply the knowledge in Computer Science required to work as a team as well as to lead a team.

PO4 Ability to analyze a problem, identify and define the computing requirements appropriate to its solution.

PO5 Apply basic terminologies and principles in problem solving scenarios through various hands on experiences.

PO6 Work as Hardware Designers with the knowledge of Networking Concepts**.**

PO7 Ability to apply mathematical foundations, algorithmic principles and computer science theory in the modeling and design of computer-based systems.

PO8 Analyze the impact of computing on individuals, organizations, and society, including ethical, legal, security, and global policy issues.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1 Identify, formulate and solve computer related problems in a way that demonstrates comprehension of the tradeoffs involved in.

PSO2 An ability to select and apply current techniques, skills, and tools necessary for problem solving and integrate Computer Technology based solutions into the user environment effectively.

PSO3 Apply design and development principles in the construction of software systemsof varying complexity.

PSO4 Provide effective and efficient real time solutions using acquired knowledge in various domains.

PSO5 An ability to design, document and develop robust applications by considering human, financial and environmental factors using cutting edge technologies to address individual and organizational needs.

UCT-1

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

COIMBATORE – 641 029

Programme Name: **B.SC COMPUTER TECHNOLOGY [B.Sc CT]**

Curriculum and Scheme of Examination under CBCS

(Applicable to the students admitted during the Academic Year 2025-2026)

Semester	Part	Subject Code	Title of the Paper	Instruction hours/cycle	Exam. Marks			Duration of Exam (hours)	Credits
					CIA	ESE	TOTAL		
I	I	25TML101	Language I@	6	25	75	100	3	3
	II	25ENG101	English -I	6	25	75	100	3	3
	III	25UCT101	Core Paper 1 - C Programming	5	25	75	100	3	4
	III	25UCT1CL	Core Practical 1 - C Programming Lab	5	40	60	100	3	2
	III	25UCT1A1	Allied Paper 1 - Discrete Mathematics and Statistics	6	25	75	100	3	5
	IV	25EVS101	Environmental Studies **	2	-	50	50	3	2
			Total	**30**	**-**	**-**	**550**	**-**	**19**
II	I	25TML202	Language II@	6	25	75	100	3	3
	II	25ENG202	English –II	6	25	75	100	3	3
	III	25UCT202	Core Paper 2 – Python with Data Structures	5	25	75	100	3	5
	III	25UCT2CM	Core Practical 2 - Python with Data Structures Lab	5	40	60	100	3	2
	III	25UCT2A2	Allied Paper 2 - Operations Research	6	25	75	100	3	5
	IV	25VED201	Value Education- Moral and Ethics**	2	-	50	50	3	2
			Total	**30**	**-**	**-**	**550**	**-**	**20**
III	I	25TML303	Language III@	6	25	75	100	3	3
	II	25ENG303	English –III	6	25	75	100	3	3
	III	25UCT303	Core Paper 3- OOPs with Java Programming	3	25	75	100	3	5
	III	25UCT3CN	Core Practical 3 - OOPs with Java Programming Lab	5	40	60	100	3	3
	III	25UCT3A3	Allied Paper 3 - Organizational Behavior and Communication Skills	6	25	75	100	3	5
	IV	25UGC3S1	Skill Based Subject 1- Cyber Security	2	100	-	100	3	3
	IV	25TBT301/ 25TAT301/ 25UHR3N1	Basic Tamil* / Advanced Tamil**/ Non-major Elective- I**	2	-	75	75	3	2
			Total	**30**	**-**	**-**	**675**	**-**	**24**
IV	I	25TML404	Language IV@	6	25	75	100	3	3
	II	25ENG404	English –IV	6	25	75	100	3	3
	III	25UCT404	Core Paper 4 - Internet of Things	3	25	75	100	3	4
	III	25UCT4CO	Core Practical 4 - Internet of Things Lab	5	40	60	100	3	4
	III	25UCT4A4	Allied Paper 4 - Digital Logic and Circuit Designs	6	25	75	100	3	5
	IV	25UCT4SL	Skill Based Subject 2- Database Management Lab	2	40	60	100	3	3
	IV	25TBT402/ 25TAT402/ 25UWR4N2	Basic Tamil* / Advanced Tamil**/ Non-major Elective- II**	2	-	75	75	3	2
			Total	**30**	**-**	**-**	**675**	**-**	**24**

	UCT-2								
V	III	25UCT505	Core Paper 5 - Web Technologies	6	25	75	100	3	5
	III	25UCT506	Core Paper 6 - Computer Networks	5	25	75	100	3	5
	III	25UCT507	Core Paper 7 - Software Engineering and Testing	6	25	75	100	3	5
	III	25UCT5CP	Core Practical 5 – Web Technologies Lab	6	40	60	100	3	2
	III	25UCT5E1	Major Elective Paper 1	5	25	75	100	3	5
	IV	-	Extra Departmental Course	2	100	-	100	3	3
	-	25UCT5SP	Aptitude and Logical Reasoning****	Grade					
			Total	**30**	**-**	**-**	**600**	**-**	**25**
VI	III	25UCT608	Core Paper 8 - Operating System	5	25	75	100	3	5
	III	25UCT609	Core Paper 9 - Distributed Computing and Cloud Computing	5	25	75	100	3	5
	III	25UCT6CQ	Core Practical 6 - Operating System with Networking Lab	5	40	60	100	3	2
	III	25UCT6CR	Core Practical 7-Case Study Lab	4	40	60	100	3	2
	III	25UCT6E2	Major Elective Paper 2	5	25	75	100	3	5
	III	25UCT6Z1	Project and viva voce***	4	20	80	100	-	5
	IV	25UBI6S3	Skill Based subject 3- Basics of Intellectual Property Right's	2	100	-	100	3	3
			Total	**30**	**-**	**-**	**700**	**-**	**27**
	V	25NCC $ / NSS/YRC /PYE/ECC/ RRC/WEC101#	Cocurricular Activities*	-	50	-	50	-	1
			Grand Total	**-**	**-**	**-**	**3800**	**-**	**140**

Note :

CBCS – Choice Based Credit system, CIA– Continuous Internal Assessment,
ESE– End of Semester Examinations

$ For those students who opt NCC under Cocurricular activities will be studying the prescribed syllabi of the UGC which will include Theory, Practical & Camp components. Such students who qualify the prescribed requirements will earn an additional 24 credits.

@ Hindi/Malayalam/ French/ Sanskrit – 25HIN/MLM/FRN/SAN101 - 404

***** - No End-of-Semester Examinations. Only Continuous Internal Assessment (CIA)

******- No Continuous Internal Assessment (CIA). Only End-of-Semester Examinations (ESE)

*** Project Report – 60 marks; Viva voce – 20 marks; Internal-20 marks

******** - Aptitude and Logical Reasoning: The Written examination will be conducted and evaluated for 100 marks. According to their marks, the grades will be awarded as given below.

Marks %	Grade
85 – 100	O
70 – 84	D
60 – 69	A
50 – 59	B
40 – 49	C
< 40	U (Reappear)

Major Elective Papers (2 papers are to be chosen from the following 6 papers)

1. Natural Language Processing
2. Blockchain Technology
3. Data Mining and Warehousing
4. Big Data Analytics and Data Science
5. Artificial Intelligence
6. Virtual Reality and Augmented Reality

Non-Major Elective Papers

1. Human Rights
2. Women's Rights
3. Consumer Affairs

Sub. Code & Title of the Extra Departmental Course (EDC):

25UCT5XL – Mixed Media Lab

 # List of Cocurricular Activities:

1. National Cadet 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)

Job Oriented Courses (JOC)

JOC -1 Office Essential Toolkits.
JOC -2 Django Framework.
JOC -3 Quantitative Aptitude.

Note: In core/ allied subjects, no. of papers both theory and practical are included wherever applicable. However, the total credits and marks for core/allied subjects remain the same as stated below.

Tally Table:

S.No.	Part	Subject	Marks	Credits
1.	I	Language – Tamil / Hindi / Malayalam / French/ Sanskrit	400	12
2.	II	English	400	12
3.	III	Core – Theory/Practical	1600	60
	III	Allied	400	20
		Electives/Project	300	15
4.	IV	Basic Tamil / Advanced Tamil (OR) Non-major Electives	150	4
		Skill Based Subjects	300	9
		EDC	100	3
		Environmental Studies	50	2
		Value Education	50	2
5.	V	Cocurricular Activities	50	1
		Total	**3800**	**140**

- 25 % CIA is applicable to all subjects except JOC, COP and SWAYAM courses which are considered as extra credit courses.

- 100 % CIA for Cyber Security, EDC and Basics of IPR.

- The students should complete **Health and Wellness Programme (25UHW401)**[###] in the 4th semester and the completion marks should be submitted through the HOD to the Controller of Examinations. Extra credits will be given to the candidates who have successfully completed.

- The students should complete any **MOOC course available for Online learning platforms like SWAYAM, NPTEL, Course era**[$$]**, IIT Bombay Spoken Tutorial, e-Pathshala etc.,** with a minimum of 4 weeks in duration before the completion of the 5th semester and the course completion certificate should be submitted through the HOD to the Controller of Examinations. Extra credits will be given to the candidates who have successfully completed.

  [$$]**Note:** One course to be taken from course era for all the under graduate students of self-finance stream during the even semester of the I year. Appropriate extra credits and certification as applicable shall be awarded to the students who have completed the course.

- An **Onsite Training** preferably relevant to the course may be undertaken as per the discretion of the HOD.

- Students who successfully complete **Naan Mudhalvan** courses in 3rd and 5th semester will be given 2 extra credits for each course. They are asked to submit the marks to Controller of Examinations through and undersigned by the HOD.

Semester	Naan Mudhalvan Course Title
III	Academy Introduction to Cloud v1 Semester 1
V	Academy Introduction to Cloud v1 Semester 2

Components of Continuous Internal Assessment

Components		Marks	Total
Theory			
CIA I	75	(75+75 = 150/10)	25
CIA II	75	15	
Assignment/Seminar		5	
Attendance		5	
Practical			
CIA Practical		25	40
Observation Notebook		10	
Attendance		5	
Project			
Review		15	20
Regularity		5	

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remembering; **K2**-Understanding; **K3**-Applying; **K4**-Analyzing; **K5**-Evaluating

1. ESE Theory Examination:

(i) CIA I & II and ESE: 75 Marks

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to 10	A (Answer all)	10 x 1 = 10	MCQ	75
K1 – K5 Q11 to 15	B (Either or pattern)	5 x 5 = 25	Short Answers	
K2 – K5 Q16 to 20	C (Either or pattern)	5 x 8 = 40	Descriptive / Detailed	

(ii) CIA I & II and ESE: 55 Marks (Allied)

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to 10	A (Answer all)	10 x 1 = 10	MCQ	55
K1 – K5 Q11 to 15	B (Either or pattern)	5 x 3 = 15	Short Answers	
K2 – K5 Q16 to 20	C (Either or pattern)	5 x 6 = 30	Descriptive / Detailed	

2. ESE Practical Examination:

Knowledge Level	Section	Marks	Total
K3	Experiments	50	60
K4	Record Work	10	
K5			

3. ESE Project Viva Voce:

Knowledge Level	Section	Marks	Total
K3	Project Report	60	80
K4	Viva voce	20	
K5			

4. Scheme of Evaluation - Health and Wellness Programme (25UHW401)###

Part	Description	Mark
A	Report	40
B	Attendance	20
C	Activities (Observation during Practice)	40
Total		**100**

Sub. Code**: 25UCT101**

Programme Code: 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Paper 1 – C Programming**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2025-2028	5	75	4	

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 provide exposure to problem-solving through C programming.
4. To familiarize the basic syntax and semantics of C Language

Course Outcomes (CO)

K1 to K5	CO1	Recollect various programming constructs and to develop C programs.
	CO2	Understand the fundamentals of C programming.
	CO3	Choose the right data representation formats based on the requirements of the problem.
	CO4	Analyze different Operations on arrays, functions, and pointers,
	CO5	Evaluate the usage of structures, unions and files.

Syllabus

UNIT I **15 Hours**

Overview of C: History of C – Importance of C- Sample programs – Basic Structure of C programs – Programming style. Constants, Variables and Data types: Character set – C Tokens – Keywords and Identifiers – Constants – Variables – Data types – Operators and Expressions– Type conversions in Expressions – Operator precedence and Associativity - Managing Input and Output operations: Reading and Writing Character - Formatted Input – Formatted Output

UNIT II **15 Hours**

Decision making and Branching: Decision making with if statement – Simple if statement – The if..else statement-nested if - else-if ladder – The switch statement. Looping: The while statement – The do statement – The for statement – **Jumps in loops***.

Sub. Code**: 25UCT101**

UNIT III **15 Hours**

Arrays : Introduction – one dimensional Arrays – Declaration of one dimensional Arrays – Initialization of one dimensional Arrays – Two dimensional Arrays – Initializing Two dimensional Arrays – Multidimensional Arrays. Character Arrays and Strings: String handling functions.

User defined functions: Definition of Functions – Function Declaration – Category of Functions – No Arguments and No Return values – Arguments but No Return values – Arguments with Return values – No Arguments but Returns a value- Functions that Return Multiple Values- Recursion – Passing Arrays to Functions – The Scope, Visibility and Lifetime of Variables.

UNIT IV **15 Hours**

Pointers : Understanding pointers –Accessing the Address of the Variable- Declaring pointer variables – Pointer and Arrays- Pointers and Character strings – Array of pointers –Pointers as Function Arguments- Functions returning pointers.

UNIT V **15 Hours**

Structures and Unions: Introduction – Defining a Structure – Declaring Structure variables – Structure Initialization –Array of Structures-Arrays with in Structures-Structures with in Structures – **Unions***.

File Management in C: Defining and Opening a File – Closing File – Input / Output Operations on Files – Command Line Arguments.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar /Quiz/Discussion / Flipped Class / Peer Learning / Experiential Learning / Blended learning

TEXT BOOK

1. E. Balagurusamy, (2011), **Programming in ANSI C**, Fifth Edition, Tata Mc Graw Hill Publication

REFERENCE BOOKS

1. Ashok N Kamthane, (2007), **Programming with ANSI and Turbo C**, PearsonEducation Publication.
2. P.J.Deitel and H.M.Deitel, (2008), **C How to Program**, Fifth Edition, Tata Mc Graw Hill Publication.

Sub. Code**: 25UCT101**

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	H	H
CO2	S	S	H	S	S
CO3	S	M	H	H	H
CO4	S	S	S	S	M
CO5	S	M	S	S	S

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

Sub. Code**: 25UCT1CL**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Practical 1 – C Programming Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development / Employability
2025-2028	5	75	2	

Course Objectives

1. To introduce the field of programming using C language.
2. To enhance the analyzing and problem solving skills and use the same for writing programs in C.
3. Encourage students to approach programming challenges methodically, from problem analysis and algorithm design to coding, debugging, and testing.

Course Outcomes (CO)

K3 to K5	CO1	Develop logical and programming skills using the fundamentals and basics of C Language.
	CO2	Apply effective usage of arrays and strings.
	CO3	Implement functions to arranging set of values using different sorting techniques.
	CO4	Apply pointers to perform memory management.
	CO5	Implement files and command line arguments.

LIST OF PRACTICAL PROGRAMS

1. Write a C program to find the roots of a Quadratic Equation.
2. Write a C program to find the greatest and smallest number from set of numbers.
3. Write a C program to find the sum, average, standard deviation from set of numbers.
4. Write a C program to find the given input is a palindrome or not.
5. Write a C program to perform String functions.
6. Write a C program to arrange a set of numbers in ascending order using bubble sort.
7. Write a program to convert decimal to binary using recursive function.
8. Write a C program Using function to perform following operation.
   - ✓ Read two integer arrays with unsorted elements.
   - ✓ Sort them into ascending order.
   - ✓ Merge the sorted arrays and print the elements.
9. Write a generalized program to perform matrix operation.
10. Write a program to print the student's mark statement using Structure.
11. Write a program to manipulate array elements using Pointers.
12. Write a program to display an image using graphics in C.

Sub. Code**: 25UCT1CL**

13. Write a program, which takes a file as command line argument, and copy it to another file. At the end of the second, file writes
    - ✓ Number of characters
    - ✓ Number of words
    - ✓ Number of lines
14. ***Case Study :*** Telephone Bill Preparation

Guidelines to the distribution of marks for practical examinations

Two questions will be given for each student (3 Hours / 60 Marks)

- ✓ Record Work : 10 Marks
- ✓ Algorithm, Program, Typing and Execution : 50 Marks.

Particulars	**Program I (Marks)**	**Program II (Marks)**
Algorithm	5	5
Program Writing	15	15
Typing and Execution	5	5

TEACHING METHODS

Presentation and Program demonstration using Projector

MAPPING

PSO / CO	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	H	H	H	H
CO4	S	S	M	H	H
CO5	S	H	S	H	H

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

Sub. Code: **25UCT202**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper : **Core Paper 2 – Python with Data Structures**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	5	75	5	

Course Objectives

1. To understand the basic concepts of Python Programming.
2. To understand complex data types and tuple.
3. To impart the basic concepts of data structures and algorithms.

Course Outcomes (CO)

K1 to K5	CO1	Remember the basic of python data types and variables.
	CO2	Understand the concepts of python control statements and operators.
	CO3	Illustrate the process of structuring the data using lists, tuples and dictionaries.
	CO4	Analyze the efficiency of algorithms and its Paradigms.
	CO5	Evaluate the usage of Sorting ,Searching and Tree Techniques.

Syllabus

UNIT I **15 Hours**

Introduction to Python: Python variables, Python basic Operators, Understanding python blocks. Python Data Types, Declaring and using Numeric data types. Python Program Flow Control Conditional blocks: if, else and else if.

UNIT II **15 Hours**

Simple for loops in python, For loop using ranges, string, list and dictionaries. Use of while loops in python, Loop manipulation using pass, **continue, break and else***. Programming using Python conditional and loop blocks. Python Complex data types: Using string data type and string operations, string manipulation methods.

UNIT III **15 Hours**

Defining list and list slicing, Use of Tuple data type. List and Dictionary, Manipulations Building blocks of python programs, List manipulation. Dictionary manipulation, Programming using list and dictionary in-built functions. Python Functions, Organizing python codes using functions. Python user-defined packages. GUI Programming: Tkinter and Python Programming

Sub. Code: **25UCT202**

UNIT IV **15 Hours**

Data Structure: Introduction - The List Abstract Data Type – Linked Lists – Types of Linked Lists – Singly Linked List representation**.** Stacks and Queues: Stacks – Representation of Stacks using Arrays – Representation of Stacks using Linked Lists – Evaluation of Arithmetic Expressions – Queues – Types of Queues

UNIT V **15 Hours**

Sorting and Searching: Introduction – Bubble Sort – Insertion Sort. Sequential Search – Binary Search. Graphs: Introduction - Graph Representation and its Operations. Trees: Trees - Binary Trees – Representation of Binary Trees.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. Wesley J. Chun, **Core Python Applications Programming**, 3rd Edition , Pearson Education,2016
2. Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, **Data Structures and Algorithms in Python,** Wiley, 2013
3. Charles Dierbach, **Introduction to Computer Science using Python,** Wiley, 2015

REFERENCE BOOKS

1. Bradley N.Miller, David L.Ranum , Roman Yasinovskyy **Problem Solving with Algorithms and Data Structures Using Python,** Third Edition (Grayscale Indian Edition) , Shroff/Franklin, Beedle & Associates - 2024
2. Dr. Harsh Bhasin (2023**), Data Structures with Python: Get familiar with the common Data Structures and Algorithms in Python,** First Edition, BPB Publication.
3. Alfred V. Aho , Jeffrey D. Ullman, John E. Hopcroft (2012), **Data Structures and Algorithms,** Nineth Edition , Pearson Publication.

Sub. Code: **25UCT202**

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	M	H
CO2	S	H	S	S	S
CO3	S	S	H	M	M
CO4	S	M	H	H	M
CO5	S	S	M	S	S

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

Sub. Code : **25UCT2CM**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Practical 2 – Python with Data Structures Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development / Employability
2025-2028	5	75	2	

Course Objectives

1. To gain knowledge about the fundamentals of python programming.
2. To implement the concepts of Data Structures.
3. To Work with lists, tuples, stacks, queues, and linked lists using Python

Course Outcomes (CO)

K3 to K5	CO1	Implement the concepts of python fundamentals.
	CO2	Apply various python operations in list and tuples.
	CO3	Analyze python dictionaries.
	CO4	Apply Stack and Queue operations.
	CO5	Evaluate the implementation of Data structure sorting and searching operations.

LIST OF PRACTICAL PROGRAMS

1.Write a Python program to perform different Arithmetic Operations on numbers.

2.Write Python program to demonstrate use of Control and looping Statements

3.Write a Python program to perform following operations on Lists and Tuples:

A) Create B) Access

C) Update D) Delete

4.Write a Python program to perform following operations on Set and Dictionaries:

A) Create B) Access

C) Update D) Delete

5.Develop user defined python function for given problem:

A) Function with minimum 2 Arguments

B) Function returning values

6. Write python program to demonstrate use of User defined Packages

7.Create a simple GUI application using Tkinter to perform arithmetic operations.

8.Write a program to perform stack operations.

9.Write a program to perform Queue operation.

Sub. Code : **25UCT2CM**

10. Write a program to implement Singly Linked List.
11. Write a program to perform sorting operation.
12. Write a program to perform searching operation.
13. ***Case Study :*** Implement Magic Square of Odd Order using Ancient Indian concept.

Guidelines to the distribution of marks for practical examinations

Two questions will be given for each student (3 Hours / 60 Marks)

- ✓ Record Work : 10 Marks
- ✓ Algorithm, Program, Typing and Execution : 50 Marks.

Particulars	**Program I (Marks)**	**Program II (Marks)**
Algorithm	5	5
Program Writing	15	15
Typing and Execution	5	5

TEACHING METHODS

Presentation and Program demonstration using Projector

MAPPING

PSO / CO	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1	S	S	S	S	S
CO2	S	S	M	S	S
CO3	S	H	H	H	H
CO4	S	S	S	H	H
CO5	S	H	S	S	S

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

Sub. Code: **25UCT303**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Paper 3 – OOPs with Java Programming**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development/ Entrepreneurship
2025-2028	3	45	5	

Course Objectives

1. To develop a greater understanding of the issues involved in programming language design and object-oriented paradigms and its implementation.
2. To explore the Java Applications and to identify the variations between Standalone java applications and Web based applications.
3. To provide the advanced concepts in java programming like Package, Multi Thread, Applet, interface and AWT Components.

Course Outcomes (CO)

K1 to K5	CO1	Remember the characteristics of Procedure and Object-Oriented Programming Languages.
	CO2	Understand the fundamentals of C++ programming structure, function overloading and constructors.
	CO3	Apply the concepts Package, Thread and Applet.
	CO4	Customize AWT components and event handling.
	CO5	Evaluate the usage of Swing concepts.

Syllabus

UNIT I **9 Hours**

Principles of OOP: Software Evolution - Procedure versus OOPS - Basic concepts of oops- Benefits of OOPS - Object Oriented Languages.

Beginning with C++: History - Simple C++ Program - Structure of C++ Program. Tokens, Data types, Reference Variables – Typecasting – Operators - Control Structures.

UNIT II **9 Hours**

Functions: Function Prototyping - Call by reference - Return by reference -Function Overloading. Classes & Objects: Specifying a class - Defining member function-Member allocation for objects - Static member - Array of objects- Constructors & Destructors.

Sub. Code: **25UCT303**

UNIT III **9 Hours**

JAVA Evolution: History – Features – How Java differs from C and C++. Overview of Java Language: Introduction – Simple Java program – Structure – java Tokens -Scope of Variable – Data types – **Operators** * - Class- Object- Method.

Arrays- Strings-Inheritance: Introduction-Types of Inheritance. Interfaces: Multiple Inheritances.

UNIT IV **9 Hours**

Packages: Putting classes together- Multi Threaded Programming - Managing Errors and Exceptions.

Files: Introduction – Concept of Streams –Reading / Writing characters / Bytes-– **Random Access Files ***. Applet programming – Graphics programming – Color - Font.

AWT – Introduction – AWT Classes – Labels – PushButtons – CheckBoxs –ChoiceList – List - TextField - TextArea - MenuBar.

UNIT V **9 Hours**

Event Handling – ActionEvent – KeyEvent – MouseEvent – MouseWheelEvent -Item Event. Interface – ActionListener – ItemListener – KeyListener – MouseListener - MouseMotionListener - MouseWheelListener.

Swing Concepts – Introduction- Component & Containers – Swing Packages – JLabel – JTextField - JButton– JTree.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. E. Balagurusamy, (2012), **Object Oriented Programming with C++,** Fifth Edition, Tata Mc Graw Hill Publication. (Unit I & II)
2. E. Balagurusamy, (2010), **Programming with Java – A Primer**, Fourth Edition, Tata Mc Graw Hill Publication. (Unit III & IV)
3. Patrick Naughton, (2006), **Java Hand Book**, Tata MCGraw Hill Publication.(Unit IV)
4. Herbert Schildt (2011), **The Complete Reference Java**, 7th Edition, Tata Mc Graw Hill. (Unit V)

Sub. Code: **25UCT303**

REFERENCE BOOKS

1. Ashok N Kamthane, (2003), **Object Oriented Programming with ANSI and TurboC++,** Pearson Education Publication.
2. Patrick Naughton, Herbert Schildt, (2008), **The Complete Reference Java 2**, Fifth Edition, Tata Mc Graw Hill Publication.
3. C. Xavier, (2006), **Programming with Java 2**, First Edition, Scitech Publication.

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	S	H
CO2	S	H	H	M	S
CO3	S	M	S	M	S
CO4	S	M	M	H	M
CO5	S	S	S	H	S

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

Sub. Code : **25UCT3CN**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Practical 3 – OOPs with Java Programming Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	5	75	3	

Course Objectives

1. To develop the programs for solving the problems using function overloading, constructors, classes and object.
2. To understand the usage of Classes, Package, Interface, Multi Threading, Exception, Applet and AWT.
3. To get the overall idea about java programming structure.

Course Outcomes (CO)

K3 to K5	CO1	Implement the concepts of object-oriented programming.
	CO2	Review the java package, interface, applet and AWT Components.
	CO3	Work out all the java unique statements through the programs.
	CO4	Explore the usage of event handling mechanisms.
	CO5	Implement the concepts Java swing and Beans.

LIST OF PRACTICAL PROGRAMS

1. Write a C++ program to implement the concept of classes and objects.
2. Write a C++ program to implement the concept of functions
3. Write a program to perform Fibonacci serious using C++ concept.
4. Write a C++ program to perform constructor and destructor concepts.
5. Write a java program to perform thread concept.
6. Write a java program to illustrate exception concepts.
7. Write a java program to illustrate Applet concepts.
8. Write a java program illustrates file concepts and export the file.
9. Write a java program to perform inventory control using AWT components.
10. Write a java program to perform Mouse Event operations
11. Write a java program to create a menu bar and pull down menus.
12. Write a Java program to illustrate Key Event operations.

Sub. Code : **25UCT3CN**

13. Write a java program to perform student mark statement using swing concept.
14. Write a java program to design file explorer using JTree concept.
15. ***Case Study :*** Application Process for College Admission.

Guidelines to the distribution of marks for practical examinations

Two questions will be given for each student (3 Hours / 60 Marks)

- ✓ Record Work : 10 Marks
- ✓ Algorithm, Program, and Execution : 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	15	15
Typing and Execution	5	5

TEACHING METHODS

Presentation and Program demonstration using Projector

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	H	S	H
CO2	S	S	H	M	H
CO3	S	H	H	S	H
CO4	S	S	S	S	H
CO5	S	S	S	S	S

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

Sub. Code: **25UCT3A3**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Allied Paper 3 - Organizational Behavior and Communication Skills**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2025-2028	6	90	5	

Course Objectives

1. To specify the intellectual and behavioral competencies that graduates should process.
2. To enable the students to insight in to the management techniques and communication skills prevailing in the corporate world.
3. To be aimed at preparing young graduates to take up challenging careers in business and industry and enables them to pursue higher studies thereafter.

Course Outcomes (CO)

K1 to K5	CO1	Preparing and delivering effective role of business communication.
	CO2	Identifying and analyzing product life cycle and developing new products and product characteristics.
	CO3	Applying knowledge of pricing kinds of pricing and factors affecting changes in price.
	CO4	Applying motivational theories to improve the leadership qualities.
	CO5	Analyzing the business communication skills.

Syllabus

UNIT I **18 Hours**

Management - Meaning and Definition – Features-Functions – Importance-Difference Between Administration And Management – Management Hierarchy.

Planning – Meaning – Nature-Objectives – Importance-Steps in Planning – Advantages and Limitations –Management by Objectives.

UNIT II **18 Hours**

Organization - Meaning-Functions-Principles- Types Of Organization-Merits & Demerits - Delegation Of Authority - Decentralization - Advantages & Disadvantages. Departmentation - Meaning - Process - Basis - **Types of Departmentation** *- Importance.

Sub. Code: **25UCT3A3**

UNIT III **18 Hours**

Introducing Communication: The Communication Cycle- Brain Drain – The importance of Effective Communication in Business. Soft Skills: Defining Soft Skills – The Importance of Soft Skills – Kinds Soft Skills – How to develop Soft Skills.

UNIT IV **18 Hours**

Interpersonal Communication: Intrapersonal and Interpersonal Communication – Characteristics of Interpersonal Communication – Importance of Interpersonal Communication – How to Develop Interpersonal Skills.

UNIT V **18 Hours**

Need, Function and Kinds of a Business Letter: Need of a Business Letter- Functions of a Business Letter – Kinds of a Letter - Kinds of a Business Letter . Job Application Letter and Resumes: Introduction – A Personal Analysis – Types of Application Letters – Writing Application Letters and Resumes: General Guidelines – The Form and Content of an Application Letter – Resume / Biodata / Curriculum Vitae - **Specimen Application Letter and Resume***.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. L. M. Prasad, (2004), **Principles & Practice of Management**, Sultan Chand & Son (Units I, II).
2. Rajendra Pal, J. S. Korlahalli (2013), **Essentials of Business Communication**, Sultan Chand & Son. (Units III, IV & V).

REFERENCE BOOKS

1. Tripathy and Reddy, **Principles of Management**, Tata McGraw Hill (Unit I, II)
2. Callie Daum (2020), **Principles of Management**, Vibrant Publications.

Sub. Code: **25UCT3A3**

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	H	H
CO2	S	S	M	S	S
CO3	S	H	H	H	H
CO4	S	S	S	S	M
CO5	S	H	M	S	M

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

Sub. Code: **25UCT404**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Paper 4 – Internet of Things**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	3	45	4	

Course Objectives

1. Identify the different IoT components suitable for the applications.
2. Create a portable IoT system using Arduino/Raspberry Pi that integrates cloud computing and analytics.
3. Implement IoT applications for real-time environment.

Course Outcomes (CO)

K1 to K5	CO1	Gain a solid foundation in the principles of IoT, including its architecture, components, and communication protocols.
	CO2	Learn to design and implement IoT systems using platforms like Arduino and Raspberry Pi.
	CO3	Understand how to connect IoT devices to cloud platforms for data storage, management, and analysis.
	CO4	Apply knowledge to create end-to-end IoT solutions, from device setup to cloud integration and analytics.
	CO5	Develop practical IoT applications in areas like smart homes, healthcare, agriculture, and industry.

Syllabus

UNIT I **9 Hours**

Fundamentals of IOT: Introduction - Definition and Characteristics of IoT - Physical design - IoT Protocols - Logical design - IoT communication models, IoT Communication APIs - Enabling technologies - Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates - Domain specific IoTs - IoT Architectural view.

UNIT II **9 Hours**

Elements of IOT: IoT and M2M- difference between IoT and M2M - Software Defined Networks - Network Function Virtualization - IoT systems management – Needs - NETCONF, YANG - IoT design methodology

UNIT III **9 Hours**

IOT Protocols: Sensors and Actuators - Communication Modules – Zigbee - LoRa - RFID - Wi-Fi - Power sources.

Sub. Code: **25UCT404**

UNIT IV **9 Hours**

Building IOT with Cloud and Data Analytics: IoT platforms – Arduino – Raspberry Pi - Cloud Computing in IoT - Cloud Connectivity - Big Data Analytics - Data Visualization.

UNIT V **9 Hours**

Challenges in IOT and Case Studies: Security Concerns and Challenges - Real time applications of IoT – Home automation – Automatic lighting – Home intrusion detection – **Cities*** – Smart parking – Environment – Weather monitoring system – Agriculture – Smart irrigation.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. Arshdeep Bahga, Vijay Madisetti, **Internet of Things-A hands-on approach**, Universities Press, 2015.
2. Olivier Hersent, David Boswarthick, Omar Elloumi, **The Internet of Things: Key applications and Protocols**, Wiley Publications 2nd Edition, 2013.

REFERENCE BOOKS

1. Raj Kamal, **Internet of Things – Architecture and Design Principles,** Mc Graw Hill Education Pvt. Ltd., 2017.
2. Hwaiyu Geng, P.E **Internet of Things and Data Analytics**, Wiley Publications, 2017.
3. Manoel Carlos Ramon, ―Intel® Galileo and Intel® Galileo Gen 2: **API Features and Arduino Projects for Linux Programmers**, Apress, 2014.
4. Marco Schwartz, **―Internet of Things with the Arduino** Yun‖, Packt Publishing, 2014.
5. Adrian McEwen, Hakim Cassimally, **Designing the Internet of Things,** Wiley Publications, 2012 .

Sub. Code: **25UCT404**

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	H	S	M	M	H
CO2	M	S	S	S	S
CO3	S	H	H	M	M
CO4	M	H	H	H	M
CO5	S	S	S	H	H

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

Sub. Code: **25UCT4CO**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Practical 4 – Internet of Things Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development / Employability
2025-2028	5	75	4	

Course Objectives

1. To enable students to work with IoT hardware like sensors, actuators, microcontrollers (e.g., Arduino, Raspberry Pi), and development boards to create functional IoT systems.
2. To help students design, prototype, and implement IoT solutions for various real-world applications.
3. To teach students to develop software for IoT applications, including writing code for microcontrollers, managing device communication, and integrating IoT systems with cloud services.

Course Outcomes (CO)

K3 to K5	CO1	Able to understand the types, working and characteristics of different sensors, actuators and Transducers.
	CO2	Able to perform different sensors and Actuators on Arduino-UNO board
	CO3	Able to perform different sensors and Actuators on Raspberry-Pi
	CO4	Design the IoT systems for real time applications
	CO5	Design and analyze IoT experiments and transfer the data to IoT Clouds

LIST OF PRACTICAL PROGRAMS

1. To sense the Available Networks Using Arduino.
2. Measure the Distance Using Ultrasonic Sensor and Make Led Blink Using Arduino.
3. To detect the Vibration of an Object Using Arduino.
4. Connect with the Available Wi-Fi Using Arduino.
5. Sense a Finger When it is Placed on Board Using Arduino.
6. Temperature Notification Using Arduino.
7. LDR to Vary the Light Intensity of LED Using Arduino.
8. MySQL Database Installation in Raspberry Pi.
9. SQL Queries by Fetching Data from Database in Raspberry Pi.
10. Switch Light On and Off Based on the Input of user using Raspberry Pi.
11. ***Case Study:*** To build own application for any security alert.

Sub. Code : **25UCT4CO**

Guidelines to the distribution of marks for practical examinations

Two questions will be given for each student (3 Hours / 60 Marks)

- ✓ Record Work : 10 Marks
- ✓ Algorithm, Program, and Execution : 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing and Component Connection	15	15
Execution	5	5

TEACHING METHODS

Presentation and Program demonstration using Projector

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	H	H
CO2	S	H	H	S	S
CO3	H	S	S	H	S
CO4	H	S	S	S	S
CO5	S	H	S	H	H

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

Sub. Code: **25UCT4A4**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Allied Paper 4 – Digital Logic and Circuit Designs**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	6	90	5	

Course Objectives

1. The students should get the Knowledge about the Number System, Number representation and Number Conversion.
2. To learn the concept of Digital Circuits, Circuit Constructions and Simplifications of Boolean functions.
3. To know the concept of Arithmetic Circuits, Combination Circuits, Counters and Registers.

Course Outcomes (CO)

K1 to K5	CO1	Retain the information about the Computer Number systems and conversions in Digital Computer System.
	CO2	Understand the concepts of Boolean expressions, Logic Gates and to apply the methods to simplifying the Boolean expression.
	CO3	Apply the knowledge to perform arithmetical operations using various logical circuits and to design various Synchronous and Asynchronous.
	CO4	Analyse the function of Counters and Registers.
	CO5	Evaluate the working nature of various Flip-Flops and Circuits.

Syllabus

UNIT I **18 Hours**

Indian Science & Technology: Unique Aspect of Indian Mathematics-Great mathematics and their contributions-**Arithmetic:** Square of a Number-Square Root-Cube Root. Binary mathematics and combinational problems.

Number System and Codes: Introduction – Number System – Floating Point Representation of Numbers - Arithmetic Operation – 1's and 2's Complement – 9's and 10's Complement – BCD – Codes. Logic Gates: Introduction – Logic Gates.

UNIT II **18 Hours**

Boolean Algebra and Minimization Techniques: Introduction – Boolean Logic Operations – Basic Laws of Boolean Algebra – Demorgan's Theorems – Sum of Products and Product of Sums – Karnaugh Map(Upto Four Variable).

Sub. Code: **25UCT4A4**

UNIT III **18 Hours**

Arithmetic Circuits: Introduction – Procedure – Half-Adder – Full-Adder – Half-Subtractor - Full-Subtractor - Parallel Binary Adder – Serial Adder - BCD Adder – Binary Multiplier – Binary Divider.

UNIT IV **18 Hours**

Combination Circuits : Multiplexer – De-multiplexer – Decoder – Encoders. Flip-Flops: Introduction – Latches – Flip-Flops: S-R, D, J-K and T – **Triggering of Flip-Flops***.

UNIT V **18 Hours**

Counters : Introduction – Asynchronous Counter – Synchronous Counters. Registers: Introduction – Shift Registers – Shift Counters.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. Morris Mano, (2011), **Digital Logic and Computer Design**, Thirteenth impression, TataMcGraw Hill Publication
2. B Mahadevan, Vinayak Rajat Bhat, Nagendra Pavana R N (2022) **"Introduction to Indian Knowledge System- concepts and applications**, PHI Learning Private Ltd

REFERENCE BOOKS

1. Leach Malvnio, (2005), **Digital Principles & Application** , Fifth Edition, Tata McGraw Hill Publication.
2. S. Salivahanan, S.Arivazhagan, (2007), **Digital Circuits and Design**, 3rd Edition.Noida Vikas Publishing House

Sub. Code: **25UCT4A4**

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	M	H
CO2	S	H	S	S	S
CO3	S	S	H	M	M
CO4	S	M	H	H	M
CO5	S	S	M	S	S

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

Sub. Code: **25UCT505**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Paper 5 – Web Technologies**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	6	90	5	

Course Objectives

1. To familiarize students with front-end development tools, including HTML**,** CSS**,** and JavaScript, for building responsive and interactive web pages.
2. To explore popular JavaScript frameworks for building modern web applications.
3. To help students understand DOM manipulation to create engaging user experiences.
4. To enable students to apply their knowledge by working on practical projects that require building and deploying web applications.

Course Outcomes (CO)

K1 to K5	CO1	Ability to design and develop responsive and interactive web pages using HTML**,** CSS3 and JavaScript**.**
	CO2	Understand the client side and server-side scripting.
	CO3	Ability to manipulate the DOM, handle events, and build modern, single-page applications using popular JavaScript libraries and frameworks.
	CO4	Review the concepts of MySQL and PHP Statements.
	CO5	Evaluate the usage of various XML Technologies.

Syllabus

UNIT I **18 Hours**

HTML5: Basic Tags, Tables, Forms, HTML Graphics, HTML media, HTML APIs.

CSS – Background, Borders, Margin, Box Model, Styling Text, Fonts, List, Links, Tables. CSS Overflow, Float, Inline Blocks, Pseudo Classes, Pseudo Elements, CSS Border Images, Rounded Corners.

UNIT II **18 Hours**

Java Script: Client-side scripting using java script, Introduction to Java Script, Internal and External Java Script Files, Variables, Control Statements, Loops, Arrays, String handling.

Functions in JavaScript, inputting and outputting from form elements to JavaScript. DOM concept, creating Html Elements using Java Script. Drawing 2D shapes, Handling Events. DHTML with JavaScript.

Sub. Code: **25UCT505**

UNIT III **18 Hours**

Building Single page applications with Angular Single page application – Introduction- two-way data binding, MVC in angular, Controllers, getting user inputs, Loops, Client-Side Routing – Accessing URL Data, various ways to provide data in Angular.

UNIT IV **18 Hours**

Server-Side Programming: Server-Side Scripting, Difference between Client Side and Server-Side Scripting Languages.

Introduction to PHP: Variables, Control Statements, Loops, Arrays, String Handling, PHP forms, Global variables in PHP, Regular expression and pattern matching.

UNIT V **18 Hours**

Database programming: inputting and outputting data from MySQL using PHP, Insertion, Deletion and Updating data. State management in web applications, Cookies, Application and Session State.

Introduction to Xml, usage of XML, XML tags, Elements and Attributes, Attribute Type, XML validation-DTD and XSD, XML DOM

Case study: -Application Development using Laravel framework.

***Self Study and questions for examinations may be taken from the self-study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. Thomas A Powell ,"**The Complete Reference, HTML and CSS** " McGraw Hill- USA Fifth Edition,2010
2. Steven Holzer , " **Spring into PHP ",** Tata McGraw Hill, 5th Edition, 2011.
3. Horold, Ellotte Rusty , **"XML Bible ",** John Wiley & Sons Inc, 3rd Edition, 2004

REFERENCE BOOKS

1. Steven Holzner, (2007), **The PHP Complete Reference**, Tata McGraw–Hill Publication.
2. Web Reference:- W3Schools.com

Sub. Code: **25UCT505**

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	M	S
CO2	H	H	H	M	H
CO3	H	M	H	S	M
CO4	S	S	S	H	H
CO5	S	S	S	S	H

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

Sub. Code: **25UCT506**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Paper 6 – Computer Networks**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	5	75	5	

Course Objectives

1. To provide the concepts and fundamentals of different layers used in computer networking.
2. To understand the technology, functionality and usage of the different computer network layers.
3. To understand a basic knowledge of the use of cryptography and different techniques keys used for Encryption and Decryption.

Course Outcomes (CO)

K1 to K5	CO1	Recollect OSI reference Model and knowledge of using different Layers in the networking model.
	CO2	Understand about the use of cryptography.
	CO3	Apply the techniques used in the devices like switches, repeaters, hubs. Bridges and gateways.
	CO4	Analyse different routing algorithms.
	CO5	Evaluate the usage of Symmetric-Key Signatures and Public – Key signatures.

Syllabus

UNIT I **12 Hours**

Introduction: Uses of computer networks-Network Hardware – Network Software – Reference Models.

UNIT II **15 Hours**

The Physical layer: Guided transmission media – Communication satellites – The Public Switched telephone network: Structure of the telephone system – The local loop : modems, wireless local loops Switching-Cable Television-Community Antenna Television-Internet Over Cable.

UNIT III **16 Hours**

The Data link layer: Data link layer design issues -The Medium access control sub layer: The channel allocation problem – Multiple access protocols: **ALOHA*-**Carrier sense multiple access protocols, collision-free protocols, Limited-Contention protocols – Data link layer switching: repeaters, hubs, bridges, switches, routers and **gateways***.

Sub. Code: **25UCT506**

UNIT IV **16 Hours**

The Network layer: Network layer design issues – Routing algorithms: The shortest path routing, distance vector routing, routing for mobile hosts, link state routing, hierarchical routing, broadcast routing and multicast routing.

The Transport layer: The Transport service: Services provided to the upper layers, transport service primitives, Berkeley sockets – Elements of Transport protocols.

UNIT V **16 Hours**

The Internet Transport Protocols: UDP-Introduction to UDP-Remote Procedure Calls - TCP-Introduction to TCP- TCP Service Model .The Application layer: DNS– Electronic mail - Architecture and services-User agent. Network Security: Cryptography – DES – RSA. Digital Signatures: Symmetric-Key Signatures, Public-Key signatures.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOK

1. Andrew S. Tanenbaum, (2003), **Computer Networks**, Fourth Edition, Pearson Education Publication.

REFERENCE BOOKS

1. Behrouz A. Forouzan, (2003), **Data Communications And Network**, Second Edition, Tata Mc Graw Hill Publication.
2. William A Shay, (2001), **Understanding Data Communications and Networks**, Second Edition, Vikas Publication.

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	M	H	S	H
CO2	S	S	M	S	H
CO3	S	S	H	H	M
CO4	S	H	S	M	M
CO5	S	H	S	M	M

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

Sub. Code: **25UCT507**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Paper 7 – Software Engineering and Testing**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2025-2028	6	90	5	

Course Objectives

1. To remember the methods and technologies involved in building complex software.
2. To understand the various steps involved in developing software including requirement elicitation, System design, object design and testing.
3. To implement the Software testing techniques in the projects.

Course Outcomes (CO)

K1 to K5	CO1	Remember the steps involved in developing the software.
	CO2	Understand the roles and responsibilities of various persons involved in development cycle.
	CO3	Implement the methods and techniques to develop a small project.
	CO4	Analyze the problems that may occur in each and every phase of software development cycle.
	CO5	Evaluate the usage of Integration and Acceptance testing.

Syllabus

UNIT I **18 Hours**

Introduction – The evolving role of software – Software crisis – software myths – Software engineering technology – The software process – Software process models.

UNIT II **18 Hours**

Requirements engineering Tasks – Developing Use-Cases – Negotiating requirements – Validating requirements – Requirement analysis – Data modeling concepts – Flow oriented modeling.

UNIT III **18 Hours**

Design engineering – Design concepts – Data Design – Performing user interface Design - The golden rules - Design heuristics for effective modularity.

Sub. Code: **25UCT507**

UNIT IV **18 Hours**

Types of testing: White box testing-Black Box Testing: What and How to do Black box testing – Requirement based testing – Positive and Negative Testing – Boundary Value Analysis – Decision Tables – Equivalence partitioning – State Based or graphic Based Testing – Compatibility Testing – **User Documentation** * – Domain Testing.

UNIT V **18 Hours**

Integrating Testing: Introduction - Integration Testing as a Type of Testing – Integration Testing as a phase Testing.

System and Acceptance Testing: Introduction – Functional Versus Non – Functional System Testing – Functional System Testing – Non - Functional System Testing - **Acceptance Testing *.**

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. Roger S Pressman, (2005), **Software Engineering**, Sixth Edition, TMH Publication. (UnitsI, II and III)
2. Srinivasan Desikan, Gopalaswamy Ramesh,(2008), **Software Testing Principles and Practices**, Dorling Kindersely Publication. (Units IV and V)

REFERENCE BOOKS

1. Watts S Humphrey, (2008), **A discipline for Software Engineering**, First Edition, Pearson Education Publication.
2. Ian Somerville, (2007), **Software Engineering**, Seventh Edition, Pearson Education Publication.

Sub. Code: **25UCT507**

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	M	H	S	H
CO2	S	H	M	S	H
CO3	S	S	H	H	M
CO4	S	H	S	S	S
CO5	S	H	H	M	H

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

Sub. Code: **25UCT5CP**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Practical 5 – Web Technologies Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development/ Entrepreneurship
2025-2028	6	90	2	

Course Objectives

1. Learn to structure Web pages using HTML,CSS ,Java Script
2. Understand the technique for creating dynamic and interactive web applications.
3. To be able to design their own website.

Course Outcomes (CO)

K3 to K5	CO1	Create well-structured static web pages using HTML and CSS.
	CO2	Build interactive and dynamic web pages using client-side scripting languages like JavaScript.
	CO3	Develop Server- side and Client -side applications
	CO4	Connect web applications to databases and perform basic data operations
	CO5	Understand and work with XML documents and schemas

LIST OF PRACTICAL PROGRAMS

1. Write a html program to design static web page any organization.
2. Develop and demonstrate the usage of inline, internal and external style sheet using CSS
3. Create a registration page and validate the fields using java script.
4. Create a dynamic web pages using DHTML Events.
5. Create a web page using graphics concepts.
6. Create a web page using angular framework.
7. Write a PHP Program using controls and functions.
8. Write a PHP program to demonstrate use of various built in string functions
9. Develop a PHP Program for parsing and Regular Expressions.
10. Write a PHP Program and check message passing mechanism between Pages.
11. Write a PHP Program to print all the values using indexed array and associate array.
12. Develop a PHP Program to display student information using MYSQL table
13. Develop a PHP Program to design a college application form using MYSQL table.
14. Design a web page using XML concepts.
15. ***Case Study:*** Design own web site using all the above web technology concept.

Sub. Code : **25UCT5CP**

Guidelines to the distribution of marks for practical examinations

Two questions will be given for each student (3 Hours / 60 Marks)

- ✓ Record Work : 10 Marks
- ✓ Algorithm, Program, and Execution : 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing and Design	15	15
Typing and Execution	5	5

TEACHING METHODS

Presentation and Program demonstration using Projector

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	H	S
CO2	S	M	M	H	H
CO3	S	H	S	H	H
CO4	S	S	S	H	H
CO5	S	S	H	H	H

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

Sub. Code: **25UCT608**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Paper 8 – Operating System**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2025-2028	5	75	5	

Course Objectives

1. To learn the fundamentals of Operating Systems.
2. To understand the structure and organization of the file system, process management, CPU Scheduling and Memory Management.
3. To provide the design principles of Android operating system.

Course Outcomes (CO)

K1 to K5	CO1	Recollect the basic functionality of the salient features of operating systems like DOS history, Processing states, Interrupts and Switching concepts.
	CO2	Understand the concepts of storage management, paging and page replacement concepts.
	CO3	Apply various optimization techniques in operating systems.
	CO4	Analyse the implementation and avoidance of Deadlock in multiprogramming systems.
	CO5	Evaluate the functionalities of Android operating system.

Syllabus

UNIT I **15 Hours**

Introduction - What is an OS? -Mainframe system-Desktop Systems-Multiprocessor systems-Distributed systems-Clustered systems-**Real-Time systems***. Operating system structures: System components-OS services-System calls.

UNIT II **15 Hours**

Process Management: Process concept -process scheduling-Operations on process – Cooperating Process-inter-process communication. CPU scheduling: Basic Concepts - Scheduling criteria-Scheduling algorithms-Multiple-processor Scheduling-Real-Time Scheduling.

.

Sub. Code: **25UCT608**

UNIT III **15 Hours**

Deadlocks: Deadlock characterization-Methods for handling Deadlocks - Deadlocks prevention - Deadlock avoidance - deadlock detection – Recovery from Deadlock. Memory management: Background – Swapping - Contiguous memory allocation - paging – segmentation - segmentation with paging.

UNIT IV **15 Hours**

Virtual memory: Demand paging-Process creation - Page replacement - Thrashing. I/O Systems: Disk structure - Disk scheduling – Disk management – **Swap Space management** *. File systems: File concepts - Access methods - Directory structure - File system structure- Directory implementation - Allocation methods - Recovery.

UNIT V **15 Hours**

Case Studies: Android – WAP - Open handset alliance - Android platform - Configure develop environment - SDK license agreement-Exploring the core android application framework- Android emulator - **Testing your development environment***- Building your first android application - Create and configure - Core files and directories - Launch configuration - Running.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. Abraham Silberschatz, Galvin, Gagne (2004) , **Operating Systems Concepts**, Sixth Edition,John Wiley & Sons. (Unit I – IV)
2. Lauren Darcey, Shane Conder, (2012), **Android – Wireless Application Development** (Volume - I, Third Edition, Pearson Publication. (Unit V)

Sub. Code: **25UCT608**

REFERENCE BOOKS

1. Achyut S Godbole, (2006), **Operating Systems**, Tata Mc Graw Hill Publication.
2. Jorg H.Kloss, (2013), **Android Apps with APP Inventor** ,Pearson Publication.

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	M	H
CO2	S	H	S	S	S
CO3	S	S	H	M	M
CO4	S	M	H	H	M
CO5	S	H	S	S	S

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

Sub. Code: **25UCT609**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Paper 9 – Distributed Computing and Cloud Computing**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	5	75	5	

Course Objectives

1. Understanding Distributed Systems and cloud computing Systems.
2. Gain knowledge of algorithms used in distributed systems
3. Learn about Network protocols and Technologies relevant to distributed and cloud systems.

Course Outcomes (CO)

K1 to K5	CO1	Ability to Design and Implement Distributed Systems.
	CO2	Ability to Understand Cloud Technologies.
	CO3	Ability to Apply Distributed Algorithms.
	CO4	Ability to Analyze and Optimize Performance.
	CO5	Ability to Solve Real-World Problems in distributed and cloud computing.

Syllabus

UNIT I **15 Hours**

Introduction to Distributed Computing Concepts: Basic concepts of distributed systems- distributed computing models- issues in designing distributed systems.

Inter Process Communication: Fundamental concepts related to inter process communication including message passing mechanism- Concepts of group communication.

Remote Communication: Remote Procedural Call (RPC)- Remote Method Invocation (RMI). **Case study on Java RMI***

UNIT II **15 Hours**

Clock Synchronization: Introduction of clock synchronization-Global state, Mutual Exclusion Algorithms- Election algorithms. Synchronization in Wireless Networks.

Distributed Shared Memory: Fundamental concepts of DSM- types of DSM- various hardware DSM systems- Consistency models- issues in designing and implementing DSM systems.

Sub. Code: **25UCT609**

UNIT III **15 Hours**

Resource Management : Scheduling Algorithms - Task Assignment- Load balancing approach- Load sharing approach. Process Migration Mechanism- Thread models Distributed File System : Concepts of a Distributed File System (DFS), file models

UNIT IV **15 Hours**

Introduction to Cloud Computing: Cloud Computing history and evolution-benefits of cloud computing.

Cloud Computing Architecture : Cloud Architecture model- Types of Clouds: Public Private & Hybrid Clouds. **Cloud based services**: Platform as a service (PaaS)- Software as a service (SaaS)- Infrastructure as a service (IaaS)- Cluster computing- Grid computing- Fog computing

UNIT V **15 Hours**

Classification of Cloud Implementations: Amazon Web Services- Microsoft Azure & Google Cloud- Compute Services, Storage Services- Network Services- Database services- Additional Services. Google AppEngine (GAE)- Aneka- Comparative study of various Cloud Computing Platforms.

Cloud Issues and Challenges : Cloud computing issues and challenges like Security – Elasticity- Resource . Management and Scheduling, QoS (Quality of Service) and Resource Allocation, Identity and Access Management.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. Ian Gorton , **"Foundations of Scalable Systems: Designing Distributed Architectures"** , Shroff Publishers, 2022.
2. Ricardo Puttini, Thomas Erl, and Zaigham Mahmood**, " Cloud Computing: Concepts, Technology & Architecture"**, PHI Publisher ,2013.

Sub. Code: **25UCT609**

REFERENCE BOOK

1. Andrew S. Tanenbaum and Maarten van Steen, " **Distributed Systems: Principles and Paradigms",** Prentice Hall India Learning Private Limited,2016.

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	M	H
CO2	S	S	H	S	S
CO3	S	S	H	M	M
CO4	S	M	H	H	M
CO5	S	H	S	S	S

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

Sub. Code : **25UCT6CQ**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Practical 6 – Operating System with Networking Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	5	75	2	

Course Objectives

1. Learn how to implement system calls and manage processes.
2. Gain practical experience with process scheduling algorithms and memory allocation techniques.
3. Develop skills in networking concepts with TCP/UDP

Course Outcomes (CO)

K3 to K5	CO1	Ability to implement and manage processes, threads and memory
	CO2	Ability to understand and implement system calls.
	CO3	Ability to understand and implement Network protocol.
	CO4	Ability to apply scheduling and page replacement algorithms.
	CO5	Ability to apply Operating and Networking knowledge to solve Real -world problems.

LIST OF PRACTICAL PROGRAMS

Operating System:

1. Illustrate LINUX commands and Shell scripting.
2. Simulate the various CPU Scheduling Algorithms.
3. Illustrate the inter-process communication strategy. (like Java RMI)
4. Write a program to implement mutual exclusion by Semaphore.
5. Write a program to Implement a Deadlock Detection and Avoidance Algorithm.
6. Implement the various page replacement algorithms.

Networking:

7. Write a program to Determine Hostname from IP Address.
8. Simulation of Link State Routing algorithm.
9. Simulation of error detection method (like CRC).
10. Implement error correction using Hamming code.
11. Implement simple Client-Server communication using TCP/UDP.

Sub. Code : **25UCT6CQ**

12. Write a program to download a File using TCP sockets.
13. ***Case Study:*** To Design chat application.

Guidelines to the distribution of marks for practical examinations

Two questions will be given for each student (3 Hours / 60 Marks)

- ✓ Record Work : 10 Marks
- ✓ Algorithm, Program, and Execution : 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	15	15
Typing and Execution	5	5

TEACHING METHODS

Presentation and Program demonstration using Projector

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	H	S
CO2	S	M	M	H	H
CO3	S	H	S	H	H
CO4	S	S	S	H	H
CO5	S	S	H	H	H

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

Sub. Code : **25UCT6CR**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Practical 7 – Case Study Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	4	60	2	

Course Objectives

1. To gain knowledge about the fundamentals of programming languages.
2. To understand the concepts of various languages.
3. To gain and implement knowledge on real time applications.

Course Outcomes (CO)

K3 to K5	CO1	Develop skill in problem solving and Decision making.
	CO2	Recollect various programming structures and its methods
	CO3	Learn to think critically and solve the problems in real world situations.
	CO4	Able to differentiate ambiguities among programming languages.
	CO5	Learn to apply analytical and testing tools for real time applications.

LIST OF PRACTICAL PROGRAMS

1. Display the statement " Welcome to Problem Solving-Lab" using C,C++,Java, .NET, PHP and Python
2. Perform any one of the Data Structure Sorting Algorithms.
3. Perform any one of the Data Structure Searching Techniques.
4. Get the n digit numerical value as input from user and Reverse the value and then convert the reversed numerical value into words.
5. Prepare BMI Calculation tool.
6. Develop number conversion tool.
7. Find the unique elements in the sorted Array A. Find the size of array A after removing the duplicate elements
8. Simple website development and test it using online testing tool.
9. Develop UML diagrams for the application Library Book Management System, Draw ER diagram, Level 0 and Level 1 DFD and use case diagram using smart draw.
10. **Case Study:** To Develop your own Application.

Sub. Code : **25UCT6CR**

Guidelines to the distribution of marks for practical examinations

Two questions will be given for each student (3 Hours / 60 Marks)

- ✓ Record Work : 10 Marks
- ✓ Algorithm, Program, and Execution : 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	15	15
Typing and Execution	5	5

TEACHING METHODS

Presentation and Program demonstration using Projector

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	H	S
CO2	S	M	M	H	H
CO3	S	H	S	H	H
CO4	S	S	S	H	H
CO5	S	S	H	H	H

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

Sub. Code : **25UCT6Z1**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Project – Project and Viva - Voce *****				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	4	60	5	

Course Objectives

On successful completion of all the above courses

1. To be able to get the knowledge about selecting the task based on their course skills.
2. To get the knowledge about analytical skill for solving the selected task.
3. To get confident for implementing the task.

Course Outcomes (CO)

K3 to K5	CO1	Apply the programming skills for solving the project.
	CO2	Analyze the task and to collect the necessary information about the software.
	CO3	Evaluate the task based on the software.
	CO4	Test the project for its successful implementation
	CO5	Implement and maintain the developed system.

Guidelines to the Distribution of Marks:

CIA	Project Review	15	**20**
	Regularity	5	
ESE	Project Report	60	**80**
	Viva – Voce	20	
Grand Total			**100**

MAPPING

PSO / CO	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1	S	H	S	H	S
CO2	S	M	M	H	H
CO3	S	H	S	H	H
CO4	S	S	S	H	H
CO5	S	S	H	H	H

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

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Elective Paper - Natural Language Processing**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability/ Entrepreneurship
2025-2028	5	75	5	

Course Objectives

1. To teach the fundamentals of NLP, and also to make them for understanding CFG, PCFG in NLP.
2. To know the role of semantics of sentences and pragmatic.
3. To teach the basic concepts of speech processing along with analysis and modeling.

Course Outcomes (CO)

K1 to K5	CO1	Learn the fundamentals of natural language processing
	CO2	Understand the use of CFG and PCFG in NLP
	CO3	Understand the role of semantics of sentences and pragmatic
	CO4	Introduce Speech Production and Related Parameters of Speech.
	CO5	Show the Computation and use of techniques in the Analysis of Speech.

Syllabus

UNIT I **15 Hours**

Origins and challenges of NLP – Language Modeling: Grammar-Based LM, Statistical LM – Regular Expressions, Finite-State Automata – English Morphology, Transducers for Lexicon and Rules, Tokenization, Detecting and Correcting Spelling Errors, Minimum Edit Distance

UNIT II **15 Hours**

Unsmoothed n-grams, Evaluating n-Grams, Smoothing, Interpolation and Backoff – Word Classes, Part-of-Speech Tagging, Rule-Based, Stochastic and Transformation-Based Tagging, Issues in Postagging – Hidden Markov and Maximum Entropy Models.

UNIT III **15 Hours**

Context Free Grammars, Grammar Rules for English, Treebanks, Normal Forms for Grammar – Dependency Grammar – Syntactic Parsing, Ambiguity, Dynamic Programming Parsing – Shallow Parsing – Probabilistic CFG, Probabilistic CYK, Probabilistic Lexicalized CFGS – Feature Structures, Unification of Feature Structures.

UNIT IV **15 Hours**

Requirements for Representation, First-Order Logic, Description Logics – Syntax-Driven Semantic Analysis, Semantic Attachments – Word Senses, Relations between Senses, Thematic Roles, Selectional Restrictions – Word Sense Disambiguation, WSD using Supervised, Dictionary & Thesaurus, Bootstrapping Methods – Word Similarity using Thesaurus and Distributional Methods.

UNIT V **15 Hours**

Speech Fundamentals: Articulatory Phonetics – Production and Classification of Speech Sounds; Acoustic Phonetics – Acoustics of Speech Production; Review of Digital Signal Processing Concepts; Short-Time Fourier Transform, Filter- Bank and LPC methods.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. Daniel Jurafsky, James H. Martin, **Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech,** Pearson Publication, 2014.
2. Steven Bird, Ewan Klein and Edward Loper, **Natural Language Processing with Python**, First Edition, OReilly Media, 2009.

REFERENCE BOOKS

1. 1. Breck Baldwin**, Language Processing with Java and LingPipe Cookbook**, Atlantic Publisher, 2015
2. Richard M Reese, **Natural Language Processing with Java,** OReilly Media, 2015.

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	M	H	S	H
CO2	S	H	M	S	H
CO3	S	S	H	M	M
CO4	S	H	S	H	M
CO5	S	H	S	H	M

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

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Elective Paper – Blockchain Technology**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability/ Entrepreneurship
2025-2028	5	75	5	

Course Objectives

1. To understand the concepts of block chain technology.
2. To understand the consensus and hyper ledger fabric in block chain technology.
3. To analyze the benefits and limitations of blockchain technology in different domains..

Course Outcomes (CO)

K1 to K5	CO1	State the basic concepts of block chain
	CO2	Paraphrase the list of consensus and Demonstrate and Interpret working of Hyper ledger Fabric.
	CO3	Implement SDK composer tool and explain digital identity for government
	CO4	Analyze the role of cryptographic hash functions, digital signatures, and consensus mechanisms in blockchain security.
	CO5	Apply cryptographic techniques in blockchain applications.

Syllabus

UNIT I **15 Hours**

History : Digital Money to Distributed Ledgers – Design Primitives : Protocols, Security, Consensus, Permissions.

Privacy : Block chain Architecture and Design-Basic crypto primitives: Hash, Signature-Hash chain to Block chain-Basic consensus mechanisms.

UNIT II **15 Hours**

Requirements for the consensus protocols-Proof of Work (PoW)-Scalability aspects of Block chain consensus protocols: Permissioned Block chains-Design goals-Consensus protocols for Permissioned Block chains.

UNIT III **15 Hours**

Decomposing the Consensus Process-Hyper Ledger Fabric Components-Chain Code Design and Implementation: Hyper Ledger Fabric II:-Beyond Chain Code: Fabric SDK and Front End-Hyper Ledger Composer Tool.

UNIT IV **15 Hours**

Block Chain in Financial Software and Systems (FSS): -Settlements, -KYC, -Capital Markets- Insurance-Block Chain in Trade / Supply Chain: Provenance of Goods, Visibility, Trade / Supply Chain Finance, Invoice Management / Discounting**.**

UNIT V **15 Hours**

Block chain for Government: Digital Identity, Land Records and Other Kinds of Record Keeping between Government Entities, Public Distribution System / Social Welfare Systems: Block chain Cryptography: Privacy and Security on Block chain.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. Mark Gates, **Block chain: Ultimate guide to understanding block chain, bit coin, crypto currencies, smart contracts and the future of money**, Wise Fox Publishing and Mark Gates 2017.
2. Salman Baset, Luc Desrosiers, Nitin Gaur, Petr Novotny, Anthony O'Dowd, Venkatraman Ramakrishna, **Hands-On Block chain with Hyper ledger: Building decentralized applications with Hyperledger Fabric and Composer,** 2018.
3. Bahga, Vijay Madisetti, **Block chain Applications: A Hands-On Approach,** Arshdeep Bahga, Vijay Madisetti publishers 2017.

REFERENCE BOOKS

1. Andreas Antonopoulos, Mastering Bitcoin: Unlocking Digital Crypto currencies, O'Reilly Media, Inc. 2014.
2. Melanie Swa, Block chain ,O'Reilly Media 2014.

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	M	H	S	S
CO2	M	H	M	S	M
CO3	S	H	M	H	M
CO4	S	M	H	M	S
CO5	H	S	S	H	S

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

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Elective Paper – Data Mining and Warehousing**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability/ Entrepreneurship
2025-2028	5	75	5	

Course Objectives

1. To understand the different techniques in Data Mining and to develop the knowledge aboutData Warehousing, Data Mining and KDD process.
2. To study the methodology of data warehousing and data mining to derive business rules for decision support systems.
3. To describe and demonstrate the data mining algorithms and methods.

Course Outcomes (CO)

K1 to K5	CO1	Remember the basic concepts in database management system and understand the discovery of knowledge in databases.
	CO2	Understand the techniques of genetic algorithms, neural networks and decision trees.
	CO3	Apply various classification algorithms in data mining.
	CO4	Analyse the clustering algorithms and rule generation algorithms.
	CO5	Evaluate the process flow within a data warehouse, Extract and load process, clean and transform data, Backup and archive process.

Syllabus

UNIT I **15 Hours**

Basic Data Mining Tasks - Data Mining Versus Knowledge Discovery in Databases – Data Mining Issues – Data Mining Matrices – Social Implications of Data Mining – Data Mining from Data Base Perspective.

UNIT II **15 Hours**

Data Mining Techniques – a Statistical Perspective on data mining – Similarity Measures – Decision Trees – Neural Networks – Genetic Algorithms.

UNIT III **15 Hours**

Classification: Introduction – Statistical-based Algorithms – Distance Based Algorithms – **Decision Tree-based Algorithms *** – Neural Network-based Algorithms –Rule-based Algorithms – Combining Techniques.

UNIT IV **15 Hours**

Clustering: Introduction – Similarity and Distance Measures – Outliers - Hierarchical Algorithms - Association Rules: Introduction - Large Item Sets – Basic Algorithms – Parallel and Distributed Algorithms.

UNIT V **15 Hours**

Delivery process: Introduction – Data warehouse delivery method. System processes: Overview - typical process flow within a data warehouse – Extract and load process – clean and transform data - Backup and archive process – **Query management process***.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. Margaret H.Dunbam, (2003), **Data Mining Introductory and Advanced Topics**, Pearson Education Publication. (Units I To IV).
2. Sam Anahory, Dennis Murray, (2007), **Data Warehouse in the Real World – Practical Guide for building decision Support System**, Second Impression, (Unit V).

REFERENCE BOOK

1. Jiawei Han, Micheline Kamber, (2001), **Data Mining Concepts and Techniques**, Academic Press Publication.

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	M	H	M	H
CO2	S	H	M	H	H
CO3	S	S	H	H	M
CO4	S	H	S	M	M
CO5	S	S	S	H	H

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

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Elective Paper - Big Data Analytics and Data Science**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability/ Entrepreneurship
2025-2028	5	75	5	

Course Objectives

1. To provide the fundamental concepts in Big data & Data science.
2. To understand Data Classification, Sources of Data, Data Science user- roles and skills.
3. To get the knowledge in basics of R and statistical measures.

Course Outcomes (CO)

K1 to K5	CO1	Remember the fundamental concepts and techniques of Big data and data science in 360 view of Customer.
	CO2	Understand data and its types.
	CO3	Apply the methodologies of data science.
	CO4	Analyse the basics of R tool and data visualization using R.
	CO5	Evaluate data Visualization in Big Data.

Syllabus

UNIT I **15 Hours**

Understanding Big Data: Introduction – Concepts and Terminology – Big Data Characteristics – Different types of Data. Business Motivation and Drivers for Big Data Adoption: Marketplace Dynamics – Business Architecture – Business Process management.

UNIT II **15 Hours**

Big Data Adoption and Planning Considerations**:** Organization Prerequisites – Data Procurement Privacy - Security - Provenance - Limited Real-time Support - Big Data Analytics Lifecycle.

UNIT III **15 Hours**

Enterprise Technologies and Big Data Business Intelligence: Online Transaction Processing (OLTP) - Online Analytical Processing (OLAP) - Extract Transform Load (ETL) - Data Warehouses - Data Marts - Traditional BI - Big Data BI- Traditional Data Visualization - **Data Visualization for Big Data *.**

UNIT IV **15 Hours**

Data Science: Data Science-A Discipline – Data Science vs Statistics, Data Science vs Mathematics, Data Science vs Programming Language, Data Science vs Database, Data Science vs Machine Learning. Data Analytics – Relation: Data Science, Analytics, Big Data Analytics.

UNIT V **15 Hours**

Exploring R Basics: Introduction – Getting started – R Features – R Studio – Packages and Library – Installing and Loading Packages – Starting R – **R Basic Data types*** **- R Basic operators*** – R Objects – R File formats - Importing and Exporting files.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. Thomas Erl, Wajid Khattak, and Paul Buhler, **Big Data Fundamentals. Concepts**, **Drivers & Techniques,** Pearson Publications , (2016). (Units I & II).
2. V. Bhuvaneswari, T. Devi (2016), **Big Data Analytics: A Practitioner's Approach** (UnitsIII & IV).
3. V. Bhuvaneswari (2018), " **Data Analytics with R Programming**", Scitech Publications. (Unit V).

REFERENCE BOOKS

1. Seema Acharya and Subhashini C, (2015), **Big Data and Analytics**, Wiley Publications.
2. Nina Zumal, John Mount (2014), **Practical Data Science in R**, Managing Publication Company.

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	S	H
CO2	S	S	M	H	H
CO3	S	H	M	S	H
CO4	S	H	H	S	H
CO5	S	S	S	S	H

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

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Elective Paper - Artificial Intelligence**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability/ Entrepreneurship
2025-2028	5	75	5	

Course Objectives

1. To understand the basic concepts of Artificial Intelligence (AI) and identify the AI problems and domains.
2. To provide search techniques to solve the problems.
3. To represent and access the domain specific knowledge.

Course Outcomes (CO)

K1 to K5	CO1	Recollect various AI techniques.
	CO2	Understand the nature of AI problems and task domains of AI.
	CO3	Apply the appropriate search procedures to solve the problems by using best algorithms.
	CO4	Analyze and select the suitable knowledge representation method.
	CO5	Manipulate the acquired knowledge and infer new knowledge.

Syllabus

UNIT I **15 Hours**

Introduction: AI Problems - AI techniques - Criteria for success. Problems, Problem Spaces, Search: State space search - Production Systems - Problem Characteristics - Issues in design of Search.

UNIT II **15 Hours**

Heuristic Search techniques: Generate and Test - Hill Climbing - Best-First Search – OR Graphs – A* Algorithm - Problem Reduction – AND-OR Graph – AO* Algorithm, Constraint Satisfaction, Means-ends analysis.

UNIT III **15 Hours**

Knowledge representation issues: Representations and mappings -Approaches to Knowledge representations - Issues in Knowledge representations - Frame Problem.

UNIT IV **15 Hours**

Using Predicate logic: Representing simple facts in logic - Representing Instance and Isa relationships - Computable functions and predicates - Resolution - Natural deduction.

UNIT V **15 Hours**

Representing knowledge using rules: Procedural Vs Declarative knowledge – **Logic programming* – Forward Vs Backward reasoning** * – Matching – Control knowledge.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOK

1. Elaine Rich, Kelvin Knight and Shivashankar B Nair (2009), **Artificial Intelligence**, Tata McGraw Hill , New Delhi, Third Edition.

REFERENCE BOOK

1. Dan W. Patterson, (2007), **Introduction to Artificial Intelligence & Expert System**, Fourth Edition, Pearson, Prentice Hall.

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	H	M	H	M	H
CO2	S	H	S	M	H
CO3	H	S	H	H	M
CO4	H	S	H	S	M
CO5	S	S	S	S	H

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

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Elective Paper - Virtual Reality and Augmented Reality**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability/ Entrepreneurship
2025-2028	5	75	5	

Course Objectives

1. To gain the knowledge of historical and modern overviews and perspectives on virtual reality
2. To learn the fundamentals of sensation, perception, and perceptual training.
3. To learn the Evaluation of virtual reality from the lens of design.

Course Outcomes (CO)

K1 to K5	CO1	Identify, examine, and develop software that reflects fundamental techniques for the design and deployment of VR and AR experiences.
	CO2	Describe how VR and AR systems work.
	CO3	Choose, develop, explain, and defend the use of particular designs for AR and VR experiences
	CO4	Evaluate the benefits and drawbacks of specific AR and VR techniques on the human body.
	CO5	Identify and examine state of the art AR and VR design problems and solutions from the industry and academia.

Syllabus

UNIT I **15 Hours**

Introduction : Introduction to Augmented-Virtual and Mixed Reality, Taxonomy, technology and features of augmented reality, difference between AR ,VR and MR, Challenges with AR, AR systems and functionality, Augmented reality methods, visualization techniques for augmented reality.

UNIT II **15 Hours**

VR systems : VR as a discipline, Basic features of VR systems, Architecture of VR systems, VR hardware : VR input hardware: tracking systems, motion capture systems, data gloves, VR output hardware: **visual displays*.**

UNIT III **15 Hours**

Stereoscopic Vision & Haptic rendering: Fundamentals of the human visual system, Depth cues, Stereopsis, Retinal disparity, Haptic sense, Haptic devices, Algorithms for haptic rendering and parallax, Synthesis of stereo pairs, Pipeline for stereo images.

UNIT IV **15 Hours**

VR Software Development: Challenges in VR software development, Master/slave and Client/server architectures, Cluster rendering, Game Engines and available SDK to develop VR applications for different hardware (HTC VIVE, Oculus, Google VR).

AR Software Development: AR software, Camera parameters and camera calibration, Marker-based augmented reality, **AR Toolkit***

UNIT V **15 Hours**

Application of VR in Digital Entertainment: VR Technology in Film & TV Production. VR Technology in Physical Exercises and Games. Demonstration of Digital Entertainment by VR.3D user interfaces - Why 3D user interfaces. Major user tasks in VE. Interaction techniques for selection, manipulation and navigation.3DUI evaluation.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOKS

1. George Mather, Foundations of Sensation and Perception:Psychology Press; 2 edition, 2009. **The VR Book: Human-Centered Design for Virtual Reality**, by Jason Jerald
2. Jay David Bolter, Maria Engberg, Blair MacIntyre, **Reality Media: Augmented and Virtual Reality Hardcover**, 2021, The MIT Press

REFERENCE BOOKS

1. **Learning Virtual Reality** by Tony Parisi, O' Reilly
2. Burdea, G. C. and P. Coffet. **Virtual Reality Technology**, Second Edition.Wiley-IEEE Press, 2003/2006. Alan B. Craig, Understanding Augmented Reality, Concepts and Applications, Morgan Kaufmann, 2013.
3. Alan Craig, William Sherman and Jeffrey Will, **Developing Virtual Reality Applications, Foundations of Effective Design,** Morgan Kaufmann, 2009.

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	H	M	H	M	H
CO2	S	H	S	M	H
CO3	H	S	H	H	M
CO4	H	S	H	S	M
CO5	S	S	S	S	H

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

Sub Code :**25UGC3S1**

For B.A., BBA CA, B.Com, BCA and B.Sc., Degree Students				
Title of the Paper: **Skill Based Subject 1 – Cyber Security**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	2	30	3	

Course Objectives

1. The course introduces the basic concepts of Cyber Security.
2. To develop an ability to understand about various modes of Cyber Crimes and preventive measures.
3. To understand about the Cyber Legal laws and punishments.

Course Outcomes (CO)
On successful completion of the course, the students will be able to

K1 to K5	CO1	To Understand the concepts of Cyber crime and Cyber Frauds.
	CO2	To Know about Cyber Terrorism and its preventive measures.
	CO3	To Analyze about the Internet, Mobile Phone and E-commerce security issues.
	CO4	To Understand about E-mail and Social Media issues.
	CO5	To Describe about various legal responses to cybercrime.

Syllabus

UNIT I **6 Hours**

Introduction to Cyber Security: Definition of Cyber Security- Why is Cyber Security important? Layers of Cyber Security- Evolution of Cyber Security. Cyber hacking - Cyber fraud: Definition- Different modes of cyber fraud - Cyber fraud in India. Cyber pornography.

UNIT II **6 Hours**

Cyber Terrorism: Modes of cyber terrorism. Cybercrime: What is Cybercrime? Cybercrime preventive methods - Preventive steps for individuals & organizations - Kinds of cybercrime - Malware and its types – Cyber attacks.

UNIT III **5 Hours**

Internet Mobile Phone and E-commerce Security issues: Data theft - Punishment of data theft- Theft of internet hours - Internet safety tips for children & parents. Mobile phone privacy - E-Commerce security issues.

Sub Code :**25UGC3S1**

UNIT IV **6 Hours**

Email and Social media issues: Aspects of Social Media - The Vicious Cycle of unhealthy social media use- Modifying social media use to improve mental health. Computer Virus - **Antivirus – Firewalls*.**

UNIT V **7 Hours**

Cyber Forensics and Digital Evidence: What does Digital Footprint Mean? - Web Browsing and Digital Footprints- Digital Footprint examples – How to Protect Your Digital Footprints? - How to erase your Footprints? - Browser Extensions and Search Engine Deletion - Cyber Crime and Cyber Laws - Common Cyber Crimes and Applicable Legal Provisions: A Snapshot - Cyber Law (IT Law) in India – The Information Technology Act of India 2000 - Cyber Law and Punishments in India - Cyber Crime Prevention guide to users –. Regulatory Authorities.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

TEXT BOOK

1. **Cyber Security,** Text book prepared by Kongunadu Arts and Science College , Coimbatore - 29, 2022.

REFERENCE BOOKS

1. Mayank Bhushan, Rajkumar Singh Rathore, Aatif Jamshed, **Fundamental of Cyber Security,** BPB Publications, 1st Edition, 2017.
2. Anand Shinde, **Introduction to Cyber Security-Guide to the world of Cyber Security**, Notion Press,2021.
3. Paul Grishman, **Cyber Terrorism- The use of the Internet for Terrorist Purpose**, Axis Publication,1st Edition 2010.
4. Shilpa Bhatnagar, **Encyclopaedia of Cyber and Computer Hacking**, Anmol Publications, 1st Edition 2009.

Sub Code :**25UGC3S1**

WEB REFERENCES

1. http://deity.gov.in/ - Department of Electronics and Information Technology, Govt. of India.
2. http://cybercellmumbai.gov.in/ - Cybercrime investigation cell.
3. http://ncrb.gov.in/ - National Crime Records Bureau.
4. http://catindia.gov.in/Default.aspx - Cyber Appellate Tribunal.
5. http://www.cert-in.org.in/ - Indian Computer Emergency Response Team.
6. http://cca.gov.in/rw/pages/index.en.do - Controller of Certifying Authorities.
7. www.safescrypt.com - Safescrypt.
8. www.nic.in – National Informatics Centre.
9. https://www.kaspersky.com/resource-center/definitions/what-is-a-digital-footprint
10. https://geekflare.com/digital-footprint/

Sub Code: **25UGC3S1**

Question Paper Pattern

Duration: 3 Hours **Max: 75 marks**

Section - A (10x1=10)

Choose the correct answer

Section - B (5x5=25)

Short answer questions, either or type, one question from each unit.

Section - C (5x8=40)

Essay answer questions, either or type, one question from each unit.

CIA EXAMINATION MARK BREAKUP

S. NO	DISTRIBUTION COMPONENT	MARKS
1.	CIA I – 75 Marks Converted to 30	**30**
2.	CIA II – 75 Marks Converted to 30	**30**
3.	Assignment I	**10**
4.	Assignment II	**10**
5.	Attendance	**05**
6.	Any Case Study related to Cyber Security	**15**
	Total	**100**

Sub. Code **: 25UCT4SL**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Skill Based Subject 2 – Database Management Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Entrepreneurship
2025-2028	2	30	3	

Course Objectives

1. To learn and understand database programming paradigms.
2. To learn and understand oracle and MongoDB
3. To learn relational database using MongoDB and Oracle

Course Outcomes (CO)

K3 to K5	CO1	Understanding of the Database Programming Languages.
	CO2	Master the basics of Database Languages and construct Queries using Oracle and MongoDB
	CO3	Developing Database Model for real time problem
	CO4	Develop the programs using built in functions
	CO5	Understand how analytics and big data affect various functions

LIST OF PRACTICAL PROGRAMS

ORACLE

1. Create the table EMPLOYEES with the following fields:-

   (Employee_Id, First_Name, Last_Name, Email, Phone_Number, Hire_Date, Job_Id, Salary, Commission_Pct, Manager_Id, Department_Id)

   - Find out the employee id, names, salaries of all the employees
   - List out the employees who works under manager 100
   - Find the names of the employees who have a salary greater than or equal to 4800
   - List out the employees whose last name is 'AUSTIN'
   - Find the names of the employees who works in departments 60,70 and 80
   - Display the unique Manager_Id.

2. Create Client_master with the following fields(ClientNO, Name, Address, City, State, bal_due)
   - Insert five records
   - Find the names of clients whose bal_due> 5000 .

Sub. Code : **25UCT4SL**

- Change the bal_due of ClientNO " C123" to Rs. 5100
- Change the name of Client_master to Client12 .
- Display the bal_due heading as "BALANCE"

3. Create a student mark list and do the following
   - Alter the table to add total and average fields with required size.
   - Modify to increase the total field size.
   - Calculate the total and average.

4. Create Sales table with the following fields(Sales No, Salesname, Branch, Salesamount, DOB) and perform using order by and group by clauses.
   - Insert five records
   - Calculate total salesamount in each branch
   - Calculate average salesamount in each branch .
   - Display all the salesmen, DOB who are born in the month of December as day in
   - character format i.e. 21-Dec-09
   - Display the name and DOB of salesman in alphabetical order of the month.

5. Create two tables in the name Employee_Personal and Employee_Salary using Primary and Foreign key concept and perform necessary operations.
   - Display the employee details who are all getting salary above15000.
   - Display the employee name and address who are all coming from city "Coimbatore" or "Chennai".
   - Display the employee name, who are all coming from city "Coimbatore" andpin code 641029 or641001.
   - Display the employee details in descending order based on name.
6. Create a table and perform the queries using comparison, logical, set, sorting andgrouping operators.
7. Write necessary queries to perform oracle built-in functions.

MongoDB

1. Create Student Database using MongoDB and perform the following operations

   (i) Create database (ii)Create collection, (iii) insert data (iv) find (v) find one

   (vi) sort (vii) limit (viii) skip (ix) distinct (x) projection

2. Create Employee Database using MongoDB and perform the following operations
   - Update document using update() method
   - Remove only one document matching your criteria
   - Remove all documents
   - Create index in MongoDB
   - Finding the indexes in the collection
   - Drop all the indexes
3. Create a collection called sales. Create multiple documents with keys like store (id, name etc.), product (type, name etc.), quantity, region, price and sales with arrays and other data types wherever applicable.
   - Write a MongoDB query to display all the documents in the collection.
   - Write a MongoDB query to display the fields; products and price for all the documents in the collection.
   - Write a MongoDB query to display all the fields but exclude the field _id for all the documents in the collection.
   - Write a MongoDB query to display the fields product and quantity, but exclude the field _id for all the documents in the collection.
   - Write a MongoDB query to display all the sales that happened in Delhi.

Guidelines to the distribution of marks for practical examinations

Two questions will be given for each student (3 Hours / 60 Marks)

- ✓ Record Work : 10 Marks
- ✓ Algorithm, Program Writing and Execution : 50 Marks.

Particulars	**Program I (Marks)**	**Program II (Marks)**
Algorithm	5	5
Program Writing	15	15
Execution	5	5

Sub. Code **: 25UCT4SL**

TEACHING METHODS

Presentation and Program demonstration using Projector

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	H	M	M	M	M
CO2	M	M	H	H	H
CO3	H	H	S	S	S
CO4	H	S	S	H	S
CO5	S	S	S	S	H

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

Sub. Code **: 25UBI6S3**

For B.A., BBA, B.Com, BCA and B.Sc., Degree Students				
Title of the Paper: **Skill Based Subject 3 – Basics of Intellectual Property Right's**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	2	30	3	

Course Objectives

1. To create awareness about recent trends in IPR and Innovation
2. To explore the basic concepts IPR
3. To focus upon trademarks, copyrights, patents, industrial designs and traditional knowledge.
4. To learn more about managing IP rights and legal aspects.

Course Outcomes (CO)

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

K3 to K5	CO1	Know about basic concepts of IPR and patent
	CO2	Understand copyrights, industrial designs and geographical indication of goods.
	CO3	Differentiate between trademarks and trade secrets
	CO4	Acquire knowledge on parotection of traditional knowledge and plant varieties.
	CO5	Manage and protect IP Rights

UNIT I **6 Hours**

Introduction -origin and development of Intellectual Property Rights (IPR), need for protecting IP, **Patents:** Foundation of patent law, patent searching process, basic criteria of patentability. Patentable and non - patentable subject matters in India. Patent prior art search, drafting the patent specification and filing procedure

UNIT II **6 Hours**

Copyrights: Fundamentals of copyright law, originality of material, right of reproduction, right to perform the work publicly, copyright ownership issues, notice of copyright. **Industrial Designs:** Kind of protection provided in Industrial design. **Geographical Indication of Goods:** Basic aspects and need for the registration.

Sub. Code **: 25UBI6S3**

UNIT III **6 Hours**

Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, transfer of rights, selecting and evaluating trademark, registration of trademarks, claims. **Trade Secrets:** Trade secret law, determination of trade secret status, liability form is appropriation of trade secrets, trade secret litigation.

UNIT IV **6 Hours**

Protection of traditional knowledge - Objectives, concept of traditional knowledge, issues concerning, bioprospecting and biopiracy. **Protection of Plant Varieties -** Objectives, international position, plant varieties protection in India. Rights of farmers, breeders and researchers.

UNIT V **6 Hours**

Managing IP Rights: Acquiring IP Rights: letters of instruction, joint collaboration agreement, protecting IP Rights: non-disclosure agreement, cease and desist letter, settlement memorandum. **Transferring IP Rights:** Assignment contract, **license agreement***, deed of assignment. Infringement and enforcement.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion

TEXT BOOKS

1. Ramakrishna Chintakunta and M. Geethavani (2022), **A Textbook of Intellectual Property Rights**. Blue Hills publications.
2. N.K Acharya (2021), **Intellectual property rights(8thEdn)**, Asia Law House.
3. Craig Allen Nard, Michael J. Madison, and Mark P. McKenna. (2017), **Law of Intellectual Property (5thEdn),** New York Aspen publishers.
4. Barrett and Margreth (2009), **Intellectual Property,** New York Aspen publishers.
5. Deborah E.Bouchoux(2013), **Intellectual property: The Law of Trademarks, Copyrights, Patents, and Trade Secrets** ,Publisher: Cengage India

Sub. Code **: 25UBI6S3**

REFERENCE BOOKS

1. B.Ramakrishna and H.S.Anil Kumar (2017**), Fundamentals of Intellectual Property Rights: For Students, Industrialist and Patent Lawyers**, Notion Press.
2. V. K. Ahuja(2013), **Law relating to Intellectual Property Rights (2nd Edn),** LexisNexis.
3. R. Radhakrishnan and S. Balasubramanian(2008), **Intellectual Property Rights: Text and Cases**, Excel Books India.
4. D. Goeland S. Parashar (2013). IPR Biosafety and Bioethics. Pearson Education India.

CIA EXAMINATION MARK BREAKUP

The CIA Examination mark breakup for the course **Basics of IPR** is given below:

S.No.	Distribution Component	Marks
1	CIA I – 75 Marks Converted to 30	30
2	CIA II – 75 Marks Converted to 30	30
3	Assignment I	10
4	Assignment II	10
5	Attendance	05
6	Any Case Study related to IPR (as a Group)	15
	Total	**100**

Sub. Code: **25UCT5XL**

Programme Code: 11		**B. Sc Computer Technology**		
Title of the Paper: **Extra Departmental Course – Mixed Media Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2025-2028	2	30	3	

Course Objectives

1. To understand the knowledge about design Tools.
2. To gain knowledge about photo editing tool.
3. To get knowledge about video making tool

Course Outcomes (CO)

K3 to K5	CO1	Implement a range of open-source and editing tools.
	CO2	Explore the various options available in design tools.
	CO3	Assess the functionality of online photo editing tools
	CO4	Review the functionality of online design tools.
	CO5	Explore the usage of video editing tool.

LIST OF PRACTICAL PROGRAMS

1. Create an invitation card.
2. Create a college brochure.
3. Create a book cover design.
4. Create a simple visiting card.
5. Design a Letter Head
6. Design a new emblem for new product.
7. To perform image collages.
8. To make simple video for your department.

Sub. Code **: 25UCT5XL**

Guidelines to the distribution of marks for practical examinations

Two questions will be given for each student (3 Hours / 100 Marks)

- ✓ Observation : 30 Marks.
- ✓ Record : 05 Marks.
- ✓ Attendance : 05 Marks.
- ✓ Algorithm, Program Writing and Execution : 60 Marks.

  (CIA Practical I and II- 60 Marks converted into 30 Marks)

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	05	05
Program Writing	15	15
Execution	10	10

TEACHING METHODS

Presentation and Program demonstration using Projector

Sub Code : **: 25EVS101**

For B.A., BBA, B.Com, BCA and B.Sc., Degree Students					
Title of the Paper: **Part IV - Environmental Studies****					
Batch	**Semester**	**Hours / Week**	**Total Hours**	**Credits**	Skill
2025-2028	I	2	30	2	Development

Course Objectives

1. The course will provide students with an understanding and appreciation of the complex interactions of man, health and the environment. It will expose students to the multi-disciplinary nature of environmental health sciences.
2. To inculcate knowledge and create awareness about ecological and environmental concepts, issues and solutions to environmental problems.
3. To shape students into good "Ecocitizens" thereby catering to global environmental needs.
4. This course is designed to study about the types of pollutants including gases, chemicals petroleum, noise, light, global warming and radiation as well as pollutant flow and recycling and principles of environmental pollution such as air, water and soil.
5. The course will address environmental stress and pollution, their sources in natural and workplace environments, their modes of transport and transformation, their ecological and public health effects, and existing methods for environmental disease prevention and remediation.

Course Outcomes (CO)

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

K1 to K5	CO1	Understand how interactions between organisms and their environments drive the dynamics of individuals, populations, communities and ecosystems.
	CO2	Develop an in depth knowledge on the interdisciplinary relationship of cultural, ethical and social aspects of global environmental issues.
	CO3	Acquiring values and attitudes towards complex environmental socio-economic challenges and providing participatory role in solving current environmental problems and preventing the future ones.
	CO4	To gain inherent knowledge on basic concepts of biodiversity in an ecological context and about the current threats of biodiversity.
	CO5	To appraise the major concepts and terminology in the field of environmental pollutants, its interconnections and direct damage to the wildlife, in addition to human communities and ecosystems.

Syllabus

UNIT I MULTIDISCIPLINARY NATURE OF ENVIRONMENT 6 Hours

Definition : scope and importance – Need for public awareness - Natural resources – Types of resources – Forest Resources – Water Resources – Mineral Resources – Food Resources – Energy Resources – Land Resources.

Sub Code : **25EVS101**

UNIT II ECOSYSTEMS **6 Hours**

Concept of an ecosystem – Structure and functions of an ecosystem – Procedures, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food web and ecological pyramids – Structure and function of the following ecosystem – Forest Ecosystem – Grassland Ecosystem – Desert Ecosystem – Aquatic Ecosystem.

UNIT III BIODIVERSITY AND ITS CONSERVATION **6 Hours**

Introduction – Definition – Genetic – Species and ecosystem diversity- Bio geographical classification of India – Value of biodiversity – Biodiversity at global, national and local levels – India as a mega - diversity Nation - Hot spot of biodiversity – Threats to biodiversity - Endangered and endemic species of India – Conservation of Biodiversity – *Insitu* Conservation of Biodiversity – *Exsitu* Conservation of Biodiversity

UNIT IV ENVIRONMENTAL POLLUTION **6 Hours**

Definition - Causes, effects and control measures of : Air Pollution – Water Pollution – Soil Pollution – Marine Pollution – Noise Pollution – Thermal Pollution – Nuclear Pollution – Solid Waste Management: Causes, effects, control measures of urban and industrial wastes – Role of individual in prevention of pollution – Pollution case studies – domestic waste water, effluent from paper mill and dyeing, cement pollution – Disaster Management – Food, Drought, Earthquake, Tsunami, Cyclone and Landslide.

UNIT V SOCIAL ISSUES AND THE ENVIRONMENT **6 Hours**

Sustainable Development – Smart City, Urban planning, Town Planning , Urban problems related to energy – Water Conservation: Rain Water Harvesting and Watershed Management – Resettlement and rehabilitation of people, its problems and concerns, case studies Narmatha Valley Project – Environmental ethics, issues and possible solutions – Climate change, global warming, ozone layer depletion, acid rain, nuclear accidents and holocaust, case studies – Hiroshima and Nagasaki, Chernobyl – Consumerism and waste products – Environmental Protection Act – Air Pollution Act (Prevention and Control) – Water Pollution Act (Prevention and control) – Wild Life Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness – Human Population and the environment – Population Growth and Distribution – Population Explosion – Family Welfare Programme – Environment and Human Health – Human Rights – Value Education – HIV/ AIDS – Women and Child Welfare – Role of Information Technology in Environment and Human Health.

Sub Code : **25EVS101**

TEACHING METHODS

Smart Class Room / Powerpoint presentation / Seminar / Quiz /Discussion

TEXT BOOK

1. P.Arul, **A Text Book of Environmental Studies, Environmental Agency**, No 27, Nattar street, Velacherry main road, Velacheery, Chennai – 42, First Edition, Nov.2004.

REFERENCE BOOKS

1. Purohit Shammi Agarwal, A text Book of **Environmental Sciences**, Publisher Mrs.Saraswati Prohit, Student Education , Behind Naswan Cinema Chopansi Road, Jodhpur.
2. Dr.Suresh and K.Dhameja, **Environmental Sciences and Engineering** , Publisher S.K.Kataria & Sons, 424/6, Guru Nanak Street, Vaisarak, Delhi -110 006.
3. J.Glynn Henry and Gary W Heinke, **Environmental Science and Engineering**, Prentice Hall of India Private Ltd., New Delhi – 110 001

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Value Education – Environmental Studies

Question Paper Pattern

Duration: 3 hours **Total Marks : 50**

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

Sub Code : **: 25VED201**

For B.A., BBA, B.Com, BCA and B.Sc., Degree Students					
Title of the Paper: **Part IV - Value Education - Moral and Ethics****					
Batch	**Semester**	**Hours / Week**	**Total Hours**	**Credits**	Skill
2025-2028	II	2	30	2	Development

Course Objectives

1. To impart Value Education in every walk of life.
2. To help the students to reach excellence and reap success.
3. To impart the right attitude by practicing self introspection.
4. To portray the life and messages of Great Leaders.
5. To insist the need for universal brotherhood, patience and tolerance.
6. To help the students to keep them fit.
7. To educate the importance of Yoga and Meditation.

Course Outcomes (CO)

K1 to K5	CO1	Will be able to recognize Moral values, Ethics, contribution of leaders, Yoga and its practice
	CO2	Will be able to differentiate and relate the day to day applications of Yoga and Ethics in real life situations
	CO3	Can emulate the principled life of great warriors and take it forward as a message to self and the society
	CO4	Will be able to Analyse the Practical outcome of practicing Moral values in real life situation
	CO5	Could Evaluate and Rank the outcome of the pragmatic approach to further develop the skills

Syllabus

UNIT I **4 Hours**

Moral and Ethics: Introduction – Meaning of Moral and Ethics – Social Ethics – Ethics and Culture – Aim of Education.

UNIT II **6 Hours**

Life and Teachings of Swami Vivekananda: Birth and Childhood days of Swami Vivekananda – At the Parliament of Religions – Teachings of Swami Vivekananda.

UNIT III **4 Hours**

Warriors of our Nation: Subhas Chandra Bose – Sardhar Vallabhbhai Patel – Udham Singh – V. O. Chidambaram Pillai – Bhagat Singh – Tiruppur Kumaran – Dheeran Chinnamalai – Thillaiaadi Valliammai – Velu Nachiyar – Vanchinathan.

Sub Code **: 25VED201**

UNIT IV **8 Hours**

Introduction -Yoga and its benefits - Ardhasiddhasana- Yoga for peace- Yoga for health - Yoga for wellbeing - Yoga for success - Brain yoga benefits - The science of Yoga.

UNIT V **8 Hours**

Isha kriya -Surya Shakthi and it's benefits.

TEACHING METHODS

Smart Class Room / PowerPoint presentation / Seminar / Quiz / Discussion

TEXT BOOK

1. **Value Based Education – Moral and Ethics** – compiled by Kongunadu Arts and Science College (Autonomous), 3rd Edition (2024).

REFERENCE BOOKS

1. Swami Vivekananda – A Biography, **Swami Nikhilananda, Advaita Ashrama,** India, 24thReprint Edition (2010).
2. **Gandhi, Nehru, Tagore and other eminent personalities of Modern India**, Kalpana Rajaram, Spectrum Books Pvt. Ltd., revised and enlarged edition(2004).
3. **Freedom Fighters of India**, Lion M.G. Agrawal, Isha Books Publisher, First Edition (2008).
4. **Easy steps to Yoga by Swami Vivekananda**, A Divine Life Society Publication(2000).

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Value Education – Moral & Ethics

Question Paper Pattern

Duration: 3 Hours **Total Marks: 50**

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

Sub Code : **25UHR3N1**

For B.A., BBA, B.Com, BCA and B.Sc., Degree Students					
Title of the Paper: **Part IV - Non Major Elective - 1 Human Rights**					
Batch	**Semester**	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	III	2	30	2	

Course Objectives

1. To prepare for responsible citizenship with awareness of the relationship between Human Rights, democracy and development.
2. To impart education on national and international regime on Human Rights.
3. To sensitive students to human suffering and promotion of human life with dignity.
4. To develop skills on human rights advocacy
5. To appreciate the relationship between rights and duties
6. To foster respect for tolerance and compassion for all living creature.

Course Outcomes (CO)

After Completion of the Course the student will be able to

K1 to K5	CO1	To understand the hidden truth of Human Rights by studying various provisions in the Constitution of India.
	CO2	To acquire overall knowledge regarding the Feminist perspectives in the Liberative Empowerment of Women.
	CO3	To gain knowledge about various gender roles and stereotypes involved in the comprehension of gender equality and women's rights.
	CO4	To comprehend the legal provisions and policies that foreground the safety of children in the society and to promote awareness.
	CO5	To gain enhanced knowledge about sexual and gender minorities to recognize, celebrate and acknowledge the diversified forms of gender expressions and rights.

Syllabus

UNIT I **6 Hours**

HUMAN RIGHTS HUMANS RIGHTS CONSTITUTION OF INDIA: Humans Rights - Constitution Of India.

UNIT II **6 Hours**

WOMEN EMPOWERMENT IN INDIA: Feminism And Sexual Violence - Women And Liberation.

UNIT III **6 Hours**

GENDER EQUALITY AND WOMEN'S RIGHTS: Stereotype Gender Roles - Women's Education, Power And Science.

Sub Code : **25UHR3N1**

UNIT IV **6 Hours**

RIGHTS OF THE CHILD IN INDIA: Status of child in contemporary Indian society - Special Laws and Policies for protection of children.

UNIT V **6 Hours**

SOGIESC RIGHTS: Understanding SOGIESC- basic Definitions- inclusivity of SOGIESC- importance of studying SOGIESC- presence of SOGIESC in Indian Traditions- temples and cultural practices that exemplify SOGIESC in India- Genetics of Sex determination- Genetics of Intersex community- Successful SOGIESC Personalities and achievers – Alan Turing- Sally Ride- Leonardo da vinci- Alan Hart- Virginia -Woolf- Bayard Rustin- Padmini Prakash- Akkai Padmashali- K Prithika Yashini- Laxmi Narayan Tripati- Madhu Bai Kinnar-Manabi Bandhopadhyay- SOGIESC Rights and laws

TEACHING METHODS

Smart Class Room / PowerPoint presentation / Seminar / Quiz / Discussion

TEXT BOOK

1 **Human Rights** (2024), Compiled by Kongunadu Arts and Science College,Coimbatore –29.

REFERENCE BOOKS

1. **Human Rights (2018),** Jaganathan,MA.,MBA.,MMM.,ML.,ML., Humanitarian Law and Refugee Law, J.P. Arjun Proprietor, Usha Jaganathan law series, 1st floor, Armatha Nanthi Street, Magathma Gandhi Nagar, Madurai - 625014.
2. Country Report on SOGIESC Rights In India: An Unfinished Agenda.
   Weblink: https://www.ilgaasia.org/publications/india-country-report-an-unfinished-agenda
3. Intersex.
   Weblink: https://my.clevelandclinic.org/health/articles/16324-intersex
5. SOGIESC Personalities:
   https://www.bbc.com/news/world-asia-india-29357630
   https://en.wikipedia.org/wiki/Laxmi_Narayan_Tripathi
   https://en.wikipedia.org/wiki/Akkai_Padmashali
   https://www.indiatoday.in/india/story/prithika-yashini-india-first-transgender-police-officer-tamil-nadu-969389-2017-04-04

Sub. Code : **25UHR3N1**

https://yourstory.com/2018/03/first-transgendre-college-principal-west-bengal

6. SOGIESC Rights and laws

https://www.openglobalrights.org/lgbtqia-to-sogiesc-reframing-sexuality-gender-human-rights/

https://static1.squarespace.com/static/5a84777f64b05fa9644483fe/t/625ead0484f9005d75b92dd0/1650371887436/ILGA+Asia+India+Report+2021.pdf

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Question Paper Pattern

Duration: 3 Hours **Max Marks:**75

Answer all Questions

Section A (5x5=25 Marks)

Short answers, either or type, one question from each unit.

Section B (5X10=50 Marks)

Essay type questions, either or type, one question from each unit.

Sub Code: **25UWR4N2**

For B.A., BBA, B.Com, BCA and B.Sc., Degree Students					
Title of the Paper: **Part IV - Non Major Elective - 2 Women's Rights**					
Batch	**Semester**	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2025-2028	IV	2	30	2	

Course Objectives

1. To know about the laws enacted to protect Women against violence.
2. To impart awareness about the hurdles faced by Women.
3. To develop a knowledge about the status of all forms of Women to access to justice.
4. To create awareness about Women's rights.
5. To know about laws and norms pertaining to protection of Women.
6. To understand the articles which enables the Women's rights.
7. To understand the Special Women Welfare laws.
8. To realize how the violence against Women puts an undue burden on healthcare services.

Course Outcomes (CO)

After Completion of the Course the student will be able to

K1 to K5	CO1	Appraise the importance of Women's Studies and incorporate Women's Studies with other fields
	CO2	Analyze the realities of Women Empowerment, Portrayal of Women in Media, Development and Communication.
	CO3	Interpret the laws pertaining to violence against Women and legal consequences.
	CO4	Contribute to the study of the important elements in the Indian Constitution, Indian Laws for Protection of Women.
	CO5	Spell out and implement Government Developmental schemes for women and create awareness on modernization and impact of technology on Women.

Syllabus

UNIT I **6 Hours**

Women's Studies

Basic concepts of Women's studies in Higher education, Women's studies perspectives- Socialization- Patriarchy- Women's studies as an academic discipline- Growth and development of Women's studies as a discipline internationally and in India.

Sub Code: **25UWR4N2**

UNIT II **6 Hours**

Socio-economic Development of Women:

Family welfare measures, role of Women in economic development, representation of Women in media, status of Women land rights, Women Entrepreneurs, National policy for the empowerment of women.

UNIT III **6 Hours**

Womens' rights – Access to Justice

Crime against Women, domestic violence – physical abuse- verbal abuse – emotional abuse - economic abuse – minorities, dowry- harassment and death, code of conduct for work place, abetment of suicide.

UNIT IV **6 Hours**

Women Protective acts

Protective legislation for Women in the Indian constitution- Anti dowry, SITA, PNDT, and Prevention Sexual Harassment at Workplace (Visaka case), Domestic violence (Prevention) Act.

UNIT V **6 Hours**

Women and Child welfare

Safety provisions - various forms of mass media, radio, visual, internet, cyber space, texting, SMS and smart phone usage. Healing measures for the affected Women and child society by private and public sector, NGO and society.

TEACHING METHODS

Smart Class Room / Power point Presentation / Seminar / Quiz / Discussion / Flipped Class

TEXT BOOK

1 Women's Rights **(2021) Published by Kongunadu Arts & Science College, Coimbatore – 641 029.**

REFERENCE BOOKS

1. **Rights of Indian Women** , by Vipul Srivatsava. Publisher: Corporate Law Advisor ,2014.
2. **Women's security and Indian law** by Harsharam Singh. Publisher : Aabha Publishers and Distributors, 2015.
3. **Women's Property Rights in India** by Kalpaz publications, 2016.

Sub. Code : **25UWR4N2**

Question Paper Pattern

Duration: 3 Hours **Max Marks:** 75

Answer all Questions

Section A (5x5=25 Marks)

Short answers, either or type, one question from each unit.

Section B (5x10=50 Marks)

Essay type questions, either or type, one question from each unit.

For B.A., B.Sc., and BCA Degree Students				
Title of the Paper: **Part IV- Non Major Elective – Consumer Affairs**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability/ Skill Development/ Entrepreneurship
2025-2028	2	30	2	

Course Objectives

1. To familiarize the students with their rights and responsibilities as a consumer.
2. To understand the procedure of redress of consumer complaints.
3. To know more about decisions on Leading Cases by Consumer Protection Act.
4. To get more knowledge about Organizational set-up under the Consumer Protection Act
5. To impart awareness about the Role of Industry Regulators in Consumer Protection
6. To understand Contemporary Issues in Consumer Affairs

Course Outcomes (CO)

K1 to K5	CO1	Able to know the rights and responsibility of consumers.
	CO2	Understand the importance and benefits of Consumer Protection Act.
	CO3	Applying the role of different agencies in establishing product and service standards.
	CO4	Analyse to handle the business firms' interface with consumers.
	CO5	Assess Quality and Standardization of consumer affairs.

Syllabus

UNIT I **6 Hours**

Conceptual Framework - Consumer and Markets: Concept of Consumer, Nature of markets: Liberalization and Globalization of markets with special reference to Indian Consumer Markets, E-Commerce with reference to Indian Market, Concept of Price in Retail and Wholesale, Maximum Retail Price (MRP), Fair Price, GST, labeling and packaging along with relevant laws, Legal Metrology. Experiencing and Voicing Dissatisfaction: Consumer buying process, Consumer Satisfaction/dissatisfaction-Grievances-complaint, Consumer Complaining Behaviour: Alternatives available to Dissatisfied Consumers; Complaint Handling Process: ISO 10000suite

UNIT II **6 Hours**

The Consumer Protection Law in India - Objectives and Basic Concepts: Consumer rights and UN Guidelines on consumer protection, Consumer goods, defect in goods, spurious goods and services, service, deficiency in service, unfair trade practice, restrictive trade practice.

Organizational set-up under the Consumer Protection Act: Advisory Bodies: Consumer Protection Councils at the Central, State and District Levels; Adjudicatory Bodies: District Forums, State Commissions, National Commission: Their Composition, Powers, and Jurisdiction (Pecuniary and Territorial), Role of Supreme Court under the CPA with important case law.

UNIT III **6 Hours**

Grievance Redressal Mechanism under the Indian Consumer Protection Law - Who can file a complaint? Grounds of filing a complaint; Limitation period; Procedure for filing and hearing of a complaint; Disposal of cases, Relief/Remedy available; Temporary Injunction, Enforcement of order, Appeal, frivolous and vexatious complaints; Offences and penalties.

Leading Cases decided under Consumer Protection law by Supreme Court/National Commission: Medical Negligence; Banking; Insurance; Housing & Real Estate; Electricity and Telecom Services; Education; Defective Products; Unfair Trade Practices.

UNIT IV **6 Hours**

Role of Industry Regulators in Consumer Protection

- Banking: RBI and Banking Ombudsman
- Insurance: IRDA and Insurance Ombudsman
- Telecommunication: TRAI
- Food Products: FSSAI
- Electricity Supply: Electricity Regulatory Commission
- Real Estate Regulatory Authority

UNIT V **6 Hours**

Contemporary Issues in Consumer Affairs - Consumer Movement in India: Evolution of Consumer Movement in India, Formation of consumer organizations and their role in consumer protection, Misleading Advertisements and sustainable consumption, National Consumer Helpline, Comparative Product testing, Sustainable consumption and energy ratings.

Quality and Standardization: Voluntary and Mandatory standards; Role of BIS, Indian Standards Mark (ISI), Ag-mark, Hallmarking, Licensing and Surveillance; Role of International Standards: ISO an Overview.

Note: Unit 2 and 3 refers to the Consumer Protection Act, 2086. Any change in law would be added appropriately after the new law is notified.

TEACHING METHODS

Smart Class Room / Power point presentation / Seminar/ Quiz/ Discussion/ Flipped Class

SUGGESTED READINGS

1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi. (2007)**Consumer Affairs**, Universities Press.
2. Choudhary, Ram Naresh Prasad (2005). **Consumer Protection Law Provisions and Procedure**, Deep and Deep Publications PvtLtd.
3. G. Ganesan and M. Sumathy. (2012). **Globalisation and Consumerism: Issues and Challenges**, Regal Publications
4. Suresh Misra and Sapna Chadah (2012). **Consumer Protection in India: Issues and Concerns**, IIPA, NewDelhi
5. Rajyalaxmi Rao (2012), **Consumer is King,** Universal Law Publishing Company
6. Girimaji, Pushpa (2002), **Consumer Right for Everyone,** Penguin Books.
7. E-books :-www.consumereducation.in
8. Empowering Consumers e-book,www.consumeraffairs.nic.in
9. ebook,www.bis.org
10. The Consumer Protection Act, 2086 and its later versions.

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Question Paper Pattern

Duration: 3 Hours **Max Marks:**75

Answer all Questions

Section A (5X5=25 Marks)

Short answers, either or type, one question from each unit.

Section B (5X10=50 Marks)

Essay type questions, either or type, one question from each unit.

Sub. Code : **25UHW401**

All UG Courses		
Title of the Paper : **Health and Wellness**		
Batch 2025 – 2026	**Semester** IV	**Credits** 2

Skill Areas:

Physical Fitness, Nutrition, Mental Health, Awareness on Drug addiction and its effects

Purpose:

The Health & Wellness course focuses on teaching the elements of physical, mental, emotional, social, intellectual, environmental well-being which are essential for overall development of an individual. The course also addresses the dangers of substance abuse and online risks to promote emotional and mental health.

Learning Outcomes:

Upon completion of the Health & Wellness course, students will be able to:

1. Demonstrate proficiency in sports training and physical fitness practices.
2. Improve their mental and emotional well-being, fostering a positive outlook on health and life.
3. Develop competence and commitment as professionals in the field of health and wellness.
4. Awareness on drug addiction and its ill effects

Focus:

During the conduct of the Health & Wellness course, the students will benefit from the following focus areas:

1. Stress Management.
2. Breaking Bad Habits.
3. Improving Interpersonal Relationships.
4. Building Physical Strength & Inner Strength.

Role of the Facilitator:

The faculty plays a crucial role in effectively engaging with students and guiding them towards achieving learning outcomes. Faculty participation involves the following areas:

Sub. Code : **25UHW401**

1. **Mentorship & Motivation:** The Facilitator mentors students in wellness and self-discipline while inspiring a positive outlook on health. Faculty teach stress management, fitness, and daily well-being.
2. **Promoting a Safe and Inclusive Environment:** The facilitator ensures a safe, inclusive, and respectful learning environment for active student participation and benefit.
3. **Individualised Support and Monitoring Progress:** The facilitator plays a crucial role in providing personalized support, monitoring and guidance to students.

Guided Activities:

In this course, several general guided activities have been suggested to facilitate the achievement of desired learning outcomes. They are as follows:

1. Introduction to Holistic Well-being.
2. Holistic Wellness Program- Nurturing Body and Mind
3. Breaking Bad Habits Workshop.
4. Improving the elements of physical, emotional, social, intellectual, environmental and mental well-being.
5. Creating situational awareness, digital awareness.
6. Understanding substance abuse, consequences and the way out.

Period Distribution

The following are the guided activities suggested for this Audit course.

The Physical Director should plan the activities by the students.

Arrange the suitable Mentor / Guide for the wellness activities.

Additional activities and programs can be planned for Health and Wellness.

S.No	Guided Activities	Period
1	**Introduction to Holistic Well-being** 1. Introduce the core components of Health & Well-being namely Physical, mental and emotional well-being 2. Provide worksheets on all the four components individually and explain the interconnectedness to give an overall understanding.	
2	**Wellness Wheel Exercise (Overall Analysis)**	

	• Guide students to assess their well-being in various life dimensions through exercises on various aspects of well – being, and explain the benefits of applying wellness wheel. • Introduce Tech Tools: • Explore the use of technology to support well-being. • Introduce students to apps for meditation, sleep tracking, or healthy recipe inspiration.	
3	**Breaking Bad Habits (Overall Analysis)** • Open a discussion on bad habits and their harmful effects. • Provide a worksheet to the students to identify their personal bad habits. • Discuss the trigger, cause, consequence and solution with examples. • Guide them to replace the bad habits with good ones through worksheets.	
4	**Physical Well-being** **1. Fitness** Introduce the different types of fitness activities such as basic exercises, cardiovascular exercises, strength training exercises, flexibility exercises, so on and so forth. (Include theoretical explanations and outdoor activity). **2. Nutrition** Facilitate students to reflect on their eating habits, their body type, and to test their knowledge on nutrition, its sources and the benefits. **3. Yoga & Meditation** Discuss the benefits of Yoga and Meditation for one's overall health. Demonstrate different yoga postures and their benefits on the body through visuals (pictures or videos)	

Sub. Code : **25UHW401**

	4. Brain Health Discuss the importance of brain health for daily life. Habits that affect brain health (irregular sleep, eating, screen time). Habits that help for healthy brains (reading, proper sleep, exercises). Benefits of breathing exercises and meditation for healthy lungs. **5. Healthy Lungs** Discuss the importance of lung health for daily life. Habits that affect lung health (smoking, lack of exercises). Benefits of breathing exercises for healthy lungs. **6. Hygiene and Grooming** Discuss the importance of hygienic habits for good oral, vision, hearing and skin health. Discuss the positive effects of grooming on one's confidence level and professional growth. **Suggested Activities (sample):** **Nutrition:** Invite a nutritionist to talk among the students on the importance of nutrition to the body or show similar videos shared by experts on social media. Organize a 'Stove less/fireless cooking competition' for students where they are expected to prepare a nutritious dish and explain the nutritive values in parallel.	
5	**Emotional Well-being** **1. Stress Management** Trigger a conversation or provide self-reflective worksheets to identify the stress factors in daily life and their impact on students' performance. Introduce different relaxation techniques like deep breathing, progressive muscle relaxation, or guided imagery. (use audio recordings or visuals to guide them through these techniques). After practicing the techniques, have them reflect on how these methods can help manage stress in daily life. **2. Importance of saying 'NO'.**	

Sub. Code : **25UHW401**

	Explain the students that saying 'NO' is important for their Physical and mental well-being, Academic Performance, Growth and Future, Confidence, Self-respect, Strong and Healthy Relationships, building reputation for self and their family (avoid earning a bad name). Factors that prevent them from saying 'NO'. How to practice saying 'NO". **3. Body Positivity and self-acceptance** Discuss the following with the students. • What is body positivity and self-acceptance? • Why is it important? • Be kind to yourself. • Understand that everyone's unique. **Suggested Activities(Sample):** (Importance of saying 'NO') Provide worksheets to self-reflect on... ...how they feel when others say 'no' to them ...the situations where they should say 'no' Challenge students to write a song or rap about the importance of saying no and how to do it effectively. Students can perform their creations for the class.	
6	**Social Well-Being** **1. Practicing Gratitude** Discuss the importance of practicing gratitude for building relationships with family, friends, relatives, mentors and colleagues. Discuss how one can show gratitude through words and deeds. Explain how practicing gratitude can create 'ripple effect'. **2. Cultivating Kindness and Compassion** Define and differentiate between kindness and compassion. Explore practices that cultivate these positive emotions. Self-Compassion as the Foundation.	

Sub. Code : **25UHW401**

	The power of small gestures. Understanding another's perspective. The fruits of compassion. **3. Practising Forgiveness** Discuss the concept of forgiveness and its benefits. Forgiveness: What is it? and What it isn't? Benefits of forgiveness. Finding forgiveness practices. **4. Celebrating Differences** Appreciate the value of individual differences and foster inclusivity. The World: A Tapestry of Differences (cultures, backgrounds, beliefs, abilities, and appearances). Finding strength in differences (diverse perspectives and experiences lead to better problem-solving and innovation). Celebrating differences, not ignoring them (respecting and appreciating the unique qualities). Activities for celebrating differences (share culture, learn about others, embrace new experiences). **5. Digital Detox** **Introduce the students to:** The concept of a digital detox and its benefits for social well-being. How to disconnect from devices more often to strengthen real-world connections. **<u>Suggested Activities (sample)</u>**: (Practicing Gratitude) Provide worksheets to choose the right ways to express gratitude. Celebrate 'gratitude day' in the college and encourage the students to honour the house keeping staff in some way to express gratitude for their service.	
7.	**Intellectual Well-being** **1. Being a lifelong Learner** **Give students an understanding on:** The relevance of intellectual well-being in this 21st century to meet	

Sub. Code : **25UHW401**

	the expectations in personal and professional well-being The Importance of enhancing problem-solving skills Cultivating habits to enhance the intellectual well-being (using the library extensively, participating in extra-curricular activities, reading newspaper etc.) **2. Digital Literacy** **Discuss:** The key aspects of digital literacy and its importance in today's world. It is more than just liking and sharing on social media. The four major components of digital literacy (critical thinking, communication, problem-solving, digital citizenship). Why is digital literacy important? Boosting one's digital skills. **3. Transfer of Learning** Connections between different subjects – How knowledge gained in one area can be applied to others. **Suggested Activities(sample):** Intellectual Well-being. Provide worksheets to students for teaching them how to boost intellectual well-being. Ask the students to identify a long-standing problem in their locality, and come up with a solution and present it in the classroom. Also organize an event like 'Idea Expo' to display the designs, ideas, and suggestions, to motivate the students to improve their intellectual well-being.	
8	**Environmental Well-being** 1.The Importance of initiating a change in the environment. **The session could be around:** Defining Environmental well-being (physical, chemical, biological, social, and psychosocial factors) – People's behaviour, crime, pollution, political activities, infra-structure, family situation etc. Suggesting different ways of initiating changes in the environment (taking responsibility, creating awareness, volunteering,	

Sub. Code : **25UHW401**

	approaching administration). **Suggested Activities (sample):** Providing worksheets to self-reflect on how the environment affects their life, and the ways to initiate a change. Dedicate a bulletin board or wall space (or chart work) in the classroom for students to share their ideas for improving environmental well-being. Creating a volunteers' club in the college and carrying out monthly activities like campus cleaning, awareness campaigns against noise pollution, (loud speakers in public places), addressing anti-social behaviour on the campus or in their locality.	
9	**Mental Well-being** **1. Importance of self-reflection** **Discuss:** Steps involved in achieving mental well-being (self-reflection, self-awareness, applying actions, achieving mental well-being). Different ways to achieve mental well-being (finding purpose, coping with stress, moral compass, connecting for a common cause). The role of journaling in mental well-being. **2. Mindfulness and Meditation Practices** Benefits of practicing mindful habits and meditation for overall well-being. **1. Connecting with nature** Practising to be in the present moment – Nature walk, feeling the sun, listening to the natural sounds. Exploring with intention – Hiking, gardening to observe the nature. Reflecting on the emotions, and feeling kindled by nature. **2. Serving people** Identifying the needs of others. Helping others. Volunteering your time, skills and listening ear. Finding joy in giving. **3. Creative Expressions**	

Sub. Code : **25UHW401**

	Indulging in writing poems, stories, music making/listening, creating visual arts to connect with inner selves. **Suggested Activities(Sample):** (Mindfulness and Meditation) – Conducting guided meditation every day for 10 minutes and directing the students to record the changes they observe.	
10	**Situational Awareness (Developing Life skills)** **1. Being street smart** **Discuss:** Who are street smarts? Why is it important to be street smart? Characteristics of a street smart person: Importance of acquiring life skills to become street smart – (General First-aid procedure, CPR Procedure, Handling emergency situations like fire, flood etc). **2. Digital Awareness** **Discuss:** Cyber Security Information Literacy Digital Privacy Fraud Detection **Suggested Activities** (sample): (Street Smart) Inviting professionals to demonstrate the CPR Procedure Conducting a quiz on Emergency Numbers	
11	**Understanding Addiction** **Plan this session around:** Identifying the environmental cues, triggers that lead to picking up this habit. Knowing the impact of substance abuse – Adverse health conditions, social isolation, ruined future, hidden financial loss and damaging the family reputation. Seeking help to get out of this addiction. **Suggested Activities**:	

Sub. Code : **25UHW401**

	Provide Worksheets to check the students' level of understanding about substance addiction and their impacts. Share case studies with students from real-life. Play/share awareness videos on addiction/de-addiction, experts talk. *Conduct awareness programmes on Drugs and its ill effects. (Arrange Experts from the concerned government departments and NGOs working in drug addiction issues) and maintain the documents of the program.	

Closure:

Each student should submit a Handwritten Summary of their Learnings & Action Plan for the future.

Assessments:

- Use Self-reflective worksheets to assess their understanding.
- Submit the worksheets to internal audit/external audit.
- Every student's activities report should be documented and the same have to be assessed by the Physical Director with the mentor. The evaluation should be for 100 marks. No examination is required.

Scheme of Evaluation

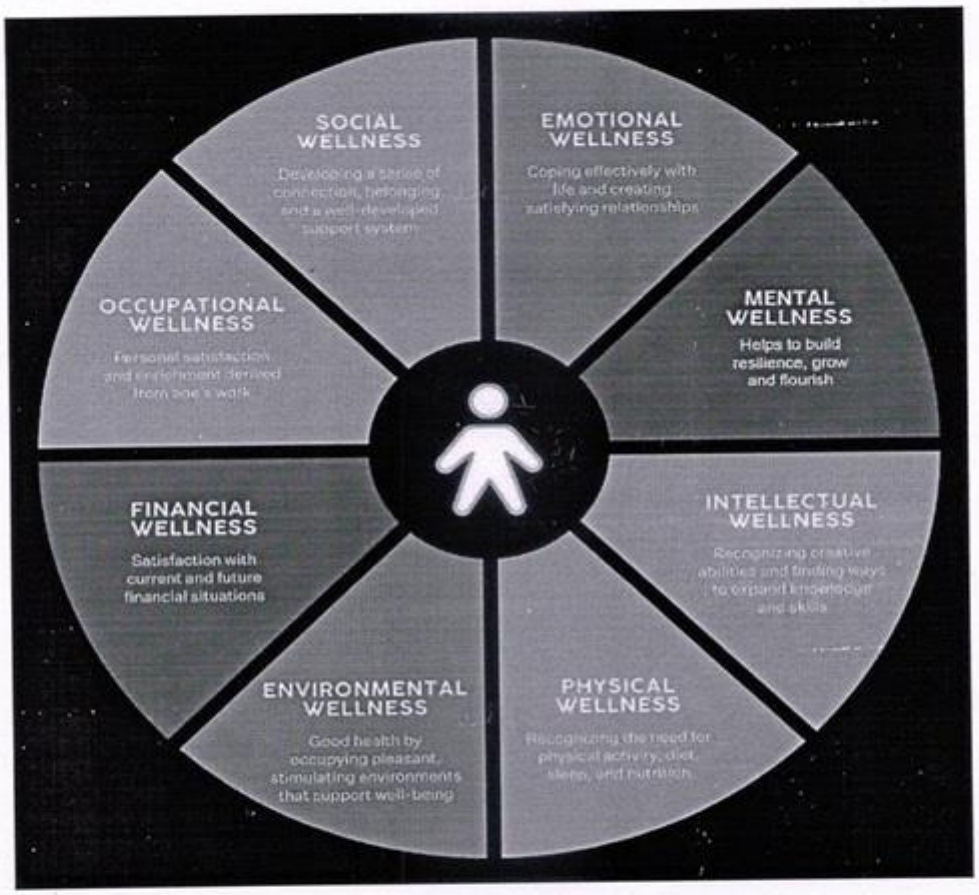
Part	Description	Marks
A	Report	40
B	Attendance	20
C	Activities (Observation During Practice)	40
Total		100

Sub. Code : **25UHW401**

References/Resource Materials:

The course acknowledges that individual needs for references and resources may vary. However, here are some general reference materials and resources that may be helpful:

1. **The Well-Being Wheel:**



2. **Facilities & Spaces:** Some activities may require access to specific facilities, resources or spaces. Students may need to coordinate with the college administration to reserve these as required.
3. **Online Resources:**
    1. United Nations Sustainable Development Goals - Goal 3 - Good Health & Well-Being: https://www.un.org/sustainabledevelopment/health/
    2. Mindfulness and Meditation: Stanford Health Library offers mindfulness and meditation resources: https://healthlibrary.stanford.edu/books-resources/mindfulness-meditation.html

Sub. Code : **25UHW401**

3. Breaking Bad Habits: James Clear provides a guide on how to build good habits and break bad ones: https://jamesclear.com/habits
4. 6 Ways to Keep Your Brain Sharp https://www.lorman.com/blog/post/how-to-keep-your-brain-sharp
5. What Is Social Wellbeing? 12+ Activities for Social Wellness https://positivepsychology.com/social-wellbeing/
6. How Does Your Environment Affect Your Mental Health? https://www.verywellmind.com/how-your-environment-affects-your-mental-health-5093687
7. How to say no to others (and why you shouldn't feel guilty) https://www.betterup.com/blog/how-to-say-no

Programme Code : 11	**B. Sc Computer Technology**		
Title of the Paper: **Job Oriented Course – 1: Office Essential Toolkits.**			
Hours / Week	**Total Hours**	**Credits**	Skill Development
3	45	2	

Course Objectives

1. Students will learn to create, format, and edit professional documents, apply styles, work with tables, graphics, headers/footers,
2. Students will develop skills in creating spreadsheets, using formulas, functions creating charts, and analyzing data through pivot tables and conditional formatting.
3. Students will learn to design effective presentations, use transitions and animations, incorporate multimedia, and apply best practices for visual storytelling.

LIST OF PRACTICAL PROGRAMS

MS Office:

1. Experiment with Document Formatting. (Font, Alignment, Page Layout, Numbering, Bulleting, Page Number, Water Mark, Page Border, etc.)
2. Experiment with Images, Header and Footers.
3. Experiment with Table.
4. Experiment with Shapes, Smart Art and Chart.
5. To Prepare the document and apply all the above concepts.

Excel:

7. Create a MS-Excel worksheet to illustrate sorting and Chart.
8. Create a MS Excel worksheet to perform Student Marks Statement.
9. Create an Excel worksheet and show implementation of conditional Formatting.
10. Create an Excel worksheet and perform various commands.

Power Point:

11. Design a power point slides using basic formatting tags.
12. Design a power point slides and showcase your departmental details with necessary objects.
13. Design a power point slides to add various animations techniques and slide show techniques.
14. Design a power point slides using background, themes, tables and chart.
15. Design a power point slides and demonstrate your skills.

Programme Code : 11	**B. Sc Computer Technology**		
Title of the Paper: **Job Oriented Course – 2: Django Framework**			
Hours / Week	**Total Hours**	**Credits**	Skill Development
3	45	2	

Course Objectives

1. To gain knowledge about the fundamentals of Django.
2. To understand the concepts of template, forms and URLs.
3. To implement the concept of authentication and cookies.

LIST OF PRACTICAL PROGRAMS

1. Create simple Django web application to display current date.
2. Create Django web application using ‘include’ template tags.
3. Develop Django web application to generate unordered and ordered list of items using for loop.
4. Create Django web application using URLs.
5. Create web application to Render HTML Forms (GET & POST) in Django.
6. Create Django web application using Index page concept.
7. Develop Django web application to demonstrate the Master Template concept.
8. Create Django web application using Built-in Field Validations.
9. Create simple Django web application to Sign Up in User accounts.
10. Develop a web application to Set and Get Cookies in Django

Programme Code : 11	**B. Sc Computer Technology**		
Title of the Paper: **Job Oriented Course – 3: Quantitative Aptitude**			
Hours / Week	**Total Hours**	**Credits**	Employability
2	30	2	

Course Objectives

1. Students will be able to solve problems involving numbers, percentages, ratios, averages, and basic algebra.
2. Enhance logical reasoning skills to analyze and solve puzzles, seating arrangements, blood relations, direction sense, and input-output problems.
3. Improve verbal reasoning and comprehension skills through practice in synonyms, antonyms, analogies, sentence correction, and reading comprehension.
4. Equip students with techniques to manage time effectively during aptitude tests, improving accuracy and speed in solving problems.

Syllabus

UNIT -I **6 Hours**

Number Systems: Types of numbers- Divisibility rules- Prime numbers, Composite numbers- HCF and LCM.

UNIT -II **6 Hours**

Arithmetic: Percentages- Ratios and Proportions- Averages- Time and Work- Time, Speed, and Distance- Averages.

UNIT -III **6 Hours**

Logical Reasoning: Verbal Reasoning- Non-Verbal Reasoning- Logical Puzzles.

UNIT -IV **6 Hours**

Miscellaneous: Number Series- Data Sufficiency- Venn Diagrams

UNIT -V **6 Hours**

Geometry – Probability – Age – Profit and Loss- Calendar – Clock

TEXT BOOKS:

1. R.S. Aggarwal, A Modern Approach to Logical Reasoning, S. Chand.

2. Arun Sharma, How to Prepare for Logical Reasoning, McGraw Hill.Defense, Cengage Lear

KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE – 641 029

DEPARTMENT OF COMPUTER TECHNOLOGY

CERTIFICATE COURSE
ON
FULL STACK DEVELOPMENT

CURRICULUM AND SCHEME OF EXAMINATIONS (CBCS)

(2025 – 2026 and Onwards)

KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

Coimbatore – 641 029

DEPARTMENT OF COMPUTER TECHNOLOGY

Vision:

- ✓ The Department of Computer Technology strives to provide a rigorous intellectual environment that fosters the search for new knowledge in a highly dynamic computing-centric society and changing students into critical thinkers and lifelong learners who can apply their knowledge and skills for the betterment of society.

Mission:

- ✓ Provide a current, comprehensive, and collaborative student-centered learning environment for Computer Technologies and professional values associated withdiscipline. Prepare students for professional careers. Promote the discovery, dissemination and application of computing knowledge.

PROGRAMME OUTCOMES (PO)

PO1	Enables the students, to develop a high-quality intellectual level, seeking to interpret various concepts and technology in current trends.
PO2	Equip students with cutting-edge skills in the field of Computer technologies to face challenges of modern computing industry.
PO3	Ability to use current technologies, skills, and computing tools, in order to make them technically greater and ethically strong with bright future.
PO4	Ability to become successful professionalsby demonstrating logical and analytical thinking.
PO5	Equip students for self-employment as well as entrepreneurship development.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1	Learning full-stack development provides In-Depth Understanding of the Development Process.
PSO2	Apply basic design principles to present ideas, information, products, and services on websites.
PSO3	Use their learned skills, knowledge and abilities to construct websites for real time applications.
PSO4	can able to work on various aspects of a project, from designing user interfaces to developing server-side logic.
PSO5	Apply employability skills including fundamental skills, personal management skills, and teamwork skills.
PSO6	Provide a systematic understanding of the concepts and theories of computer technologies and their application in the real world–to an advanced level, and enhance career prospects in a huge array of fields.

CFS-01

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

COIMBATORE – 641 029

CERTIFICATE COURSE ON FULL STACK DEVELOPMENT

Curriculum and Scheme of Examination under CBCS

(Applicable to the students admitted during the Academic Year 2025-2026)

Semester	Part	Subject Code	Title of the Paper	Instruction hours/cycle	Exam. Marks			Duration of Exam (hours)	Credits
					CIA	ESE	TOTAL		
	III	25CFS101	Web Technology	3	25	75	100	3	3
	III	25CFS102	Programming in Python	3	25	75	100	3	3
	III	25CFS1CL	Web Technology Lab	3	40	60	100	3	2
	III	25CFS1CM	Programming in Python Lab	3	40	60	100	3	2
			Total	**12**	**-**	**-**	**400**	**-**	**10**

Part-wise Total Marks:

Subject	Marks	Total credits
Core Theory	200	6
Core Practical	200	4

CIA – Continuous Internal Assessment

ESE - End of Semester Examination

Components of Continuous Internal Assessment

Components		Marks	Total
Theory			
CIA I	75	(75+75 = 150/10)	25
CIA II	75	15	
Assignment/Seminar		5	
Attendance		5	
Practical			
CIA Practical		25	40
Observation Notebook		10	
Attendance		5	

CFS-02

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remembering;**K2**-Understanding;**K3**-Applying;**K4**-Analyzing;**K5**-Evaluating

1. ESE Theory Examination:

(i) CIA I & II and ESE: 75 Marks

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to 10	A (Answer all)	10 x 1 = 10	MCQ	75
K1 – K5 Q11 to 15	B (Either or pattern)	5 x 5 = 25	Short Answers	
K2 – K5 Q16 to 20	C (Either or pattern)	5 x 8 = 40	Descriptive / Detailed	

2. ESE Practical Examination:

Knowledge Level	Section	Marks	Total
K3	Experiments	50	60
K4	Record Work	10	
K5			

CFS-03

Sub.Code: **25CFS101**

Programme Code : 11	**Certificate Course on Full Stack Development**			
Title of the Paper: **Core Paper 1 – Web Technology**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2025-2026	3	45	3	

Course Objectives

1. To impart adequate knowledge on the need of web based technologies for designing web applications.
2. To develop an in-depth understanding of client side and server side scripting.
3. To gain knowledge on PHP framework for effective design of web applications.
4. To familiarize the varies web technology tools.

Course Outcomes (CO)

K1 to K5	CO1	Recollect various elements in HTML and CSS.
	CO2	Understand the fundamentals of server side scripting.
	CO3	To gain knowledge about database management concept.
	CO4	Understand the basic concepts of NODE JS and REACT JS.
	CO5	Understand the connectivity concepts using front end and back end.

Syllabus

UNIT I : HTML and Website Builder **9 Hours**

HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets. Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script – Introduction to WordPress

UNIT II : Server Side Scripting using PHP **9 Hours**

PHP Syntax, Variables, Data Types, Strings, Constants, Operators, Control structure, Functions, Array, PHP Forms, Accessing Form Elements, Form Validation, Events, Cookies, and Sessions.

UNIT -III: MySQL **9 Hours**

Introduction to MySQL: Working with PHP and MySQL - Connecting to Database, Creating, Selecting, Deleting, Updating Records in a table, Inserting Multiple Data.

UNIT -IV: REACT JS **9 Hours**

Introduction to Node & NPM - Create React App Boilerplate & Introduction to JSX - Organising Code & Creating a Hello World Application REACT **Components and States*-** React Basics: Components with States & Props - Passing Static & Dynamic Data between Components – Event

Handling. **Working with Data, Understanding API'S and Crud Operations*- Conditional Rendering***

UNIT -V: NODE JS **9 Hours**

Introduction to Node JS & Express JS - Basic Hello World REST API in Express JS - Creating Modular Routers in Express JS.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room/ Power point presentation/Seminar/Quiz/Discussion/Flipped Class/peer Learning/Experiential Learning/Blended learning

TEXT BOOKS

1. Web Design with HTML, CSS, JavaScript and jQuery Set, Jon Duckett, John Wiley & Sons
2. PHP & MySQL: Server-side Web Development, Jon Ducket, Wiley

REFERENCE BOOKS

1. HTML5 and CSS3 for the Real World", Estelle Weyl, Louis Lazaris, Alexis Goldstein, Sitepoint
2. HTML & CSS: Design and Build Websites, Jon Duckett, John Wiley & Sons
3. Dynamic Web Programming and HTML5, Paul S. Wang, CRC Press
4. The Complete Reference: HTML and CSS, Thomas A. Powell, Mc Graw Hill
5. PHP and MySQL Web Development, Luke Welling, Addison Wesley
6. www.w3schools.com

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	H	H
CO2	S	S	H	S	S
CO3	S	M	H	H	H
CO4	S	S	S	S	M
CO5	S	M	S	S	S

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

CFS-05

Sub.Code: **25CFS102**

Programme Code : 11	**Certificate Course on Full Stack Development**			
Title of the Paper: **Core Paper 2 – Programming in Python**				
Batch 2025-2026	**Hours / Week** 3	**Total Hours** 45	**Credits** 3	Employability

Course Objectives

1. To understand why Python is useful scripting language for developers.
2. To develop an in-depth understanding in design concepts for Python applications.
3. To provide exposure to problem-solving through Python programming.
4. To develop web designing skills through Python programming.

Course Outcomes (CO)

K1 to K5	CO1	Learn how to use list, tuples and dictionaries in python programs
	CO2	Able to use indexing and slicing to access data and also indentify python objects types.
	CO3	Understand how to build package and python modules for reusability.
	CO4	Gain knowledge how to read and write files in python.
	CO5	Develop skills to design GUI in python.

Syllabus

UNIT I **9 Hours**

Introduction to Python -Data types in Python :- Numbers, Strings,Build -in functions of strings-Boolean -Understanding Iterators-Arrays in Python -List -Tuple -Dictionary-set. **Decision making statements :** Simple if-if else-if elif else.

UNIT II **9 Hours**

Looping Statements : Working with for loop- working with while loop – Range function - Iterating over python Arrays – Looping control statement- Nested loops.

Python Functions :Types of functions-Argument passing methods and Return statement in function.

Python Files :- Types of file Handling – Reading and writing files- File modes- File methods-working with Directories.

UNIT -III **9 Hours**

Modules and Packages :- Using PIP module- Use of Import – Build in and External modules-Familiar with Date Time Module – OS Module.

Sub.Code: **25CFS102**

Python Object Oriented :- Overview of OOPs- creating classes and Objects-methods and Attributes- Self Variable- Constructor- Inheritance –Polymorphism- Encapsulation

UNIT -IV 9 Hours

Modules and Packages :- Using PIP module- Use of Import – Build in and External modules- Familiar with Date Time Module – OS Module.**Python Object Oriented** :- Overview of OOPs- creating classes and Objects-methods and Attributes- Self Variable- Constructor- Inheritance – Polymorphism- Encapsulation

UNIT -V 9 Hours

Using databases in Python :-Python MYSQL Database Access – Create database Connection- Working with MySql queries using Python. MongoDB- Python MongoDB Access- Create connection using MongoDB -working with Mongo queries using python.

***Self Study and questions for examinations may be taken from the self study portions also.**

TEACHING METHODS

Smart Class Room/ Power point presentation/Seminar/Quiz/Discussion/Flipped Class/peer Learning/Experiential Learning/Blended learning

TEXT BOOK

1. E. Balaguruswamy, **"Problem Solving and Python Programming",** McGraw Hill Education (India) Pvt, 2016.

REFERENCE BOOKS

1. Gowrishankar S, Veena A. **"Introduction to Python Programming,"** CRC Press, Taylor & Francis Group, 2019
2. Allen B. Downey, **'Think Python: How to Think Like a Computer Scientist'**, 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016 (http://greenteapress.com/wp/think-python/)

   Richard L. Halterman, "**Learning To Program With Python**". Copyright © 2011 2. Python for Everybody, Exploring Data Using Python 3. Dr. Charles R. Severance. 2016.

CFS-07

Sub.Code: **25CFS102**

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	H	H
CO2	S	S	H	S	S
CO3	S	M	H	H	H
CO4	S	S	S	S	M
CO5	S	M	S	S	S

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

CFS-08

Sub.Code: **25CFS1CL**

Programme Code : 11	**Certificate Course on Full Stack Development**			
Title of the Paper: **Core Practical 1 – Web Technology Lab**				
Batch 2025-2026	**Hours / Week** 3	**Total Hours** 45	**Credits** 2	Employability

Course Objectives

1. To comprehend the basic of internet and web technologies.
2. To introduce scripting language concepts for developing client side applications.
3. To practices server side programming using PHP, CSS, NODE JS and REACT JS.
4. To familiarize with database applications.

Course Outcomes (CO)

K3 to K5	CO1	Design and develop web applications.
	CO2	Explain Client and Server side scripting and their applicability.
	CO3	Create scripting java script in web page.
	CO4	Integrate NODE JS and REACT JS in an web page.
	CO5	Design forms and check for data accuracy.

LIST OF PRACTICAL PROGRAMS

1. Create a web page for designing Application form using HTML.
2. Create calculator interface with HTML and CSS.
3. Develop basic web page/s.
   - ✓ Create a link from one webpage to another.
   - ✓ Apply image insertion into web page/s and also make hyperlinks to images.
   - ✓ Use different styles to the page elements.
   - ✓ Create, modify and format the contents of web page with CSS.
4. Write a Java Script program that on clicking a button, displays scrolling text which moves from left to right with a small delay.

5.Create dynamic interactive Web pages using JavaScript.

- ✓ Apply basic control of elements with JavaScript.
- ✓ Use Java Script to validate form entries.
- ✓ Change the appearance of web pages.
- ✓ Create HTML that can change even after a page has been loaded into a browser

6. Write a PHP code to create:
   - ✓ Create a database College in MySQL
   - ✓ Create a table Department (Dname, Dno, Number_Of_faculty)
   - ✓ Create a table named "Student" with following fields (sno, sname, percentage). Insert 3 records of your choice.
   - ✓ Display the names of the students whose percentage is between 35 to 75 in a tabular format.
7. Create a React web application to display student details.
8. Create a Node.js web application to process company details using MySQL

Guidelines to the distribution of marks for practical examinations

Two questions will be given for each student (3 Hours / 60 Marks)

- ✓ Record Work : 10 Marks
- ✓ Algorithm, Program, Typing and Execution : 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	15	15
Typing and Execution	5	5

TEACHING METHODS

Presentation and Program demonstration using Projector

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	H	H	H	H
CO4	S	S	M	H	H
CO5	S	H	S	H	H

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

CFS-10

Sub.Code: **25CFS1CM**

Programme Code : 11	**Certificate Course on Full Stack Development**			
Title of the Paper: **Core Practical 2** – **Programming in Python Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2025-2026	3	45	2	

Course Objectives

1. To impart adequate knowledge on the need of programming languages and problem solving techniques.
2. To know the basic of Python programming.
3. To demonstrate control and iterative statements with data structures in python programming.
4. To construct Graphical User Interface.

Course Outcomes (CO)

K3 to K5	CO1	To develop algorithmic solution to simple computational problems.
	CO2	To develop and execute python programs using control statements.
	CO3	To represent compound data using python list, tuples and dictionaries.
	CO4	To read and write data from and to files in python programming.
	CO5	To build web application with data base concept.

LIST OF PRACTICAL PROGRAMS

1. Python program to perform read and write operations
2. Write a program to create, concatenate and print a string and accessing sub-string from a given string.
3. Write a program to demonstrate different number data types in Python.
4. Write a program to demonstrate working with list, tuples and dictionaries in python
5. Write a python program to define a module and import a specific function in that module to another program
6. Write a Python to implement class and object concept.
7. Create a new web page usingDjango , add background color and banner to the web site.
8. CreateTicket management service to create ticket ,Edit ticket and View ticket.
9. Create Login, Signup page in Django using MySQL/ MongoDB Database.

CFS-11

Sub.Code: **25CFS1CM**

Guidelines to the distribution of marks for practical examinations

Two questions will be given for each student (3 Hours / 60 Marks)

- ✓ Record Work : 10 Marks
- ✓ Algorithm, Program, Typing and Execution : 50 Marks.

Particulars	**Program I (Marks)**	**Program II (Marks)**
Algorithm	5	5
Program Writing	15	15
Typing and Execution	5	5

TEACHING METHODS

Presentation and Program demonstration using Projector

MAPPING

PSO / CO	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	H	H	H	H
CO4	S	S	M	H	H
CO5	S	H	S	H	H

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