KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE – 641 029

DEPARTMENT OF COMPUTER TECHNOLOGY

CURRICULUM AND SCHEME OF EXAMINATIONS (CBCS)

(2024 – 2025 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 systems of 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 2024-2025)

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

	UCT-2								
V	III	24UCT505	Core Paper 5 - PHP	6	25	75	100	3	5
	III	24UCT506	Core Paper 6 - Computer Networks	5	25	75	100	3	5
	III	24UCT507	Core Paper 7 - Operating Systems	6	25	75	100	3	5
	III	24UCT5CP	Core Practical 5 – PHP Programming Lab	6	40	60	100	3	2
	III	24UCT5E1	Major Elective Paper 1	5	25	75	100	3	5
	IV	-	Extra Departmental Course	2	100	-	100	3	3
	-	24UCT5SP	Aptitude and Logical Reasoning****	Grade					
			Total	**30**	**-**	**-**	**600**	**-**	**25**
VI	III	24UCT608	Core Paper 8 - Software Engineering and Testing	5	25	75	100	3	5
	III	24UCT609	Core Paper 9 - Python Programming	5	25	75	100	3	5
	III	24UCT6CQ	Core Practical 6 - Python Programming Lab	5	40	60	100	3	2
	III	24UCT6CR	Core Practical 7-Case Study Lab	4	40	60	100	3	2
	III	24UCT6E2	Major Elective Paper 2	5	25	75	100	3	5
	III	24UCT6Z1	Project and viva voce***	4	20	80	100	-	5
	IV	24UBI6S3	Skill Based subject 3- Basics of Intellectual Property Right's	2	25	75	100	3	3
			Total	**30**	**-**	**-**	**700**	**-**	**27**
	V	24NCC $ / 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 – 24HIN/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. Cloud Computing
2. Internet of Things
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) :

24UCT5XL – Web Development and Google App 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)

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.

UCT-4

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 and EDC papers.
- The students who complete any **MOOC On learning platforms like SWAYAM, NPTEL, Course era, IIT Bombay Spoken Tutorial etc.,** 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.
- 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) 15	25
CIA II	75		
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			

Sub. Code**: 24UCT101**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Paper 1 – C Programming**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2024 - 2025	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**: 24UCT101**

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**: 24UCT101**

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**: 24UCT1CL**

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
2024 - 2025	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.

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**: 24UCT1CL**

13. Write a program, which takes a file as command line argument, and copy it to anotherfile. 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: **24UCT202**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper : **Core Paper 2 – Data Structures using C++**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2024 - 2025	5	75	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 impart adequate knowledge on the need of object oriented programming languages.
3. To impart the basic concepts of data structures and algorithms.

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	Examine different C++ features such as composition of objects, Operator overloading and inheritance.
	CO4	Analyze the efficiency of algorithms and its Paradigms.
	CO5	Evaluate the usage of Sorting ,Searching and Tree Techniques.

Syllabus

UNIT I **15 Hours**

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

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

UNIT II **15 Hours**

Functions: Function Prototyping - Call by reference - Return by reference - Inline function - Default arguments - Function Overloading.

Classes & Objects: Specifying a class - Defining member function-Member allocation for objects - Static member - Array of objects - Object as function arguments - friend functions - returning objects - pointers to members.

Sub. Code: **24UCT202**

UNIT III **15 Hours**

Constructors & Destructors: Constructor and its types - **Destructors*.**

Operator Overloading: Definition - Overloading unary and binary operators - Manipulation of strings using operators - Rules for operator overloading - Type conversions.

Inheritance: Introduction - Defining derived classes - Types of inheritance - Virtual base classes - Abstract- Constructors in derived classes.

UNIT IV **15 Hours**

Data Structure: Introduction - The List Abstract Data Type – Linked Lists – Types of Linked Lists. 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. E. Balagurusamy, (2012), **Object Oriented Programming with C++,** Fifth Edition, Tata Mc Graw Hill Publication.
2. J. John Manoj Kumar and P. Sudharsan (2007), **Data Structures Using C**, Second Edition, RBA Publications.

REFERENCE BOOKS

1. Ashok N Kamthane, (2003), **Object Oriented Programming with ANSI and Turbo C++,** Pearson Education Publication.
2. Yashavant Kanetkar, (2004**), Introduction to Object Oriented Programming and C++,** First Edition, BPB Publication.
3. Robert Kruse, C.L, Jondo Bruce Leung, (2006), **Data Structures and Program Design In C**,Second Edition, Pearson Edition Asia.
4. Alfred V. Aho , Jeffrey D. Ullman, John E. Hopcroft (2012), **Data Structures and Algorithms,** Nineth Edition , Pearson Publication.
5. Dr. A. Chitra and P.T. Rajan (2008), **Data Structures**, First Edition, Mc Graw Hill Education (India) Pvt. Ltd.

Sub. Code: 24UCT202

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 : **24UCT2CM**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Practical 2 – Data Structures with C++ Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2024 - 2025	5	75	2	

Course Objectives

1. To develop the programs for solving the problems using function overloading, constructors, classes and object.
2. To apply the object oriented programming concepts to solve the problems.

Course Outcomes (CO)

K3 to K5	CO1	Implement the concepts of object oriented programming.
	CO2	Apply string functions to perform operator overloading.
	CO3	Analyze virtual functions and inheritance.
	CO4	Apply Stack and Queue operations.
	CO5	Evaluate the implementation of Data structure sorting and searching operations.

LIST OF PRACTICAL PROGRAMS

1. Write a C++ program to implement the concept of functions and friend functions.
2. Write a C++ program to perform on concept of function overloading.
3. Write a C++ program to implement the concept of classes and objects.
4. Write a C++ program to perform arithmetic operations using constructors and destructors.
5. Write a C++ program to perform function overloading concept.
6. Write a C++ program to perform Operator Overloading concept.
7. Write a C++ program to perform string manipulation operations.
8. Write a C++ program to perform stack operations.
9. Write a C++ program to find Area and Perimeter using Virtual function and inheritance concept.

Sub. Code : **24UCT2CM**

10. Write a C++ program to perform Queue operation.

11. Write a C++ program to perform sorting operation.

12. Write a C++ program to perform searching operation.

13. ***Case Study :*** Student Mark Statement 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	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: **24UCT303**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Paper 3 – Java Programming**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development/ Entrepreneurship
2024 - 2025	5	75	5	

Course Objectives

1. To understand the difference between C, C++ and Java programs.
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 basic concepts of OOPs, Data Types, Control Statements and Tokens.
	CO2	Understand the concepts interface, package and multithreading.
	CO3	Apply the concepts Package, Thread and Applet.
	CO4	Customize AWT components and event handling.
	CO5	Evaluate the usage of Swing and Java Beans.

Syllabus

UNIT I **15 Hours**

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

UNIT II **15 Hours**

Arrays- Strings-Inheritance: Introduction-Types of Inheritance. Interfaces: Multiple Inheritances. Packages: Putting classes together- Multi Threaded Programming - Managing Errors and Exceptions.

UNIT III **15 Hours**

Files: Introduction – Concept of Streams – Stream classes – I/O Exceptions – Reading / Writing characters / Bytes- Handling primitive data types – **Random Access Files ***. Applet programming – Graphics programming – Color - Font.

Sub. Code: **24UCT303**

UNIT IV **15 Hours**

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

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

UNIT V **15 Hours**

Swing Concepts – Introduction- Component & Containers – Swing Packages – JLabel – JTextField - JButton – JTabbedPane – JTree – JTable. Java Beans – Introduction –Java Bean API- Simple Java Bean API.

***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, (2010), **Programming with Java – A Primer**, Fourth Edition, Tata Mc Graw Hill Publication. (Unit I, II and III)
2. Patrick Naughton, (2006), **Java Hand Book**, Tata MCGraw Hill Publication.(Unit IV)
3. Herbert Schildt (2011), **The Complete Reference Java**, 7th Edition, Tata Mc Graw Hill. (Unit V)

REFERENCE BOOKS

1. Patrick Naughton, Herbert Schildt, (2008), **The Complete Reference Java 2**, Fifth Edition, Tata Mc Graw Hill Publication.
2. C. Xavier, (2006), **Programming with Java 2**, First Edition, Scitech Publication.

Sub. Code: **24UCT303**

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 : **24UCT3CN**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Practical 3 – Java Programming Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2024 - 2025	5	75	3	

Course Objectives

1. To explore the knowledge in stand Alone java applications and web based Applications.
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	Practice the concepts of OOPs, java control statements, data types and Tokens.
	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 program to perform Stack Operation.
2. Write a java program to perform string functions using constructor and user defined package.
3. Write a java program to illustrate multiple inheritances.
4. Write a program to perform thread concept.
5. Write a program to illustrate exception concepts.
6. Write a program to illustrate Applet concepts.
7. Write a java program illustrates file concepts and export the file.
8. Write a program to perform inventory control using AWT components.
9. Write a java program to perform Mouse Event operations
10. Write a Java program to demonstrate the multiple selection listbox.
11. Write Java program to create a menu bar and pull down menus.
12. Write a program to illustrate Key Event operations.

Sub. Code : **24UCT3CN**

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. Write a java program to implement simple Java Bean Concept.
16. ***Case Study :*** Application Process for College.

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: **24UCT3A3**

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
2024 - 2025	4	60	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 **12 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 **12 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: **24UCT3A3**

UNIT III **12 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 **12 Hours**

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

UNIT V **12 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: **24UCT3A3**

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: **24UCT404**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Paper 4 – .NET Framework**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2024 - 2025	4	60	5	

Course Objectives

1. To design and develop the distributed event driven programming in both VB and .Net framework
2. To apply CLR, .NET framework classes and ADO.Net.
3. To analyze the Properties, Events and Methods in .Net Environment.

Course Outcomes (CO)

K1 to K5	CO1	Remember the basic Visual basic concepts and advanced features ofVB.Net.
	CO2	Understand the concepts of .Net framework Technology and summarize the advantages and disadvantages of .Net framework.
	CO3	Apply the web applications using VB.Net.
	CO4	Analyze the distributed event driven programming using .Net framework.
	CO5	Assess the database connectivity in windows and web applications.

Syllabus

UNIT I **12 Hours**

Essential Visual Basic – Upgrading from Visual Basic - .Net Frame work and the CLR – IDE– Building VB.Net Applications. Operations – Conditionals and Loops – Procedures, Scope and Exception Handling.

UNIT II **12 Hours**

Windows Forms – Adding Controls – Handling Events – Creating MDI applications – Textboxes, Rich Text boxes, Labels – Buttons, Check boxes, Radio buttons, panels and Group boxes – List box, **Checked list box***, Combo box and Picture boxes.

UNIT III **12 Hours**

Windows Forms – Scroll bars, Splitters, Track Bars, Pickers, Notify Icons, Tool tips and Timers. Menus – Built in Dialog Boxes – Image list, Tree and List view, Toolbars, Status bars and progress bars and tabbed controls.

Sub. Code: **24UCT404**

UNIT IV **12 Hours**

Web forms – Buttons, Test boxes, Labels, Literals, Place Holders, Check boxes, Radio buttons, Tables, Panels, Images, Image buttons, List boxes, Drop down lists, Hyperlinks and link buttons, **HTML controls***.

UNIT V **12 Hours**

Data Access with ADO.net – binding controls to database – database access with web applications – creating window services, web services and deploying applications.

***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. Steven Holzner, (2005), **Visual Basic .NET Black Book**, First Edition, Dream Tech Publication.

REFERENCE BOOKS

1. Evangelos Petroustes, (2002), **Mastering Visual Basic .NET**, First Edition, BPB Publication. Steven Holzner, (2005), **Visual Basic .NET Black Book**, First Edition, Dream TechPublication.
2. Bill Evjen Beres, (2002), **Visual Basic .NET Programming Bible**, Wiley – DreamTech Publication.

MAPPING

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

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

Sub. Code : **24UCT4CO**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Practical 4 – .Net Framework Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2024 - 2025	6	90	3	

Course Objectives

1. To design and develop the applications using ADO.Net and session tracking.
2. To make the students to develop the database projects with a back end concept.
3. To construct .NET applications and to maintain the database.
4. To familiarize the students in crystal report creation.

Course Outcomes (CO)

K3 to K5	CO1	Apply the decision and control structures in .NET and apply the concepts of queries and creation of console applications.
	CO2	Analyze the concept of windows application and project creation and Oracle functions.
	CO3	Construct web based applications using ASP.NET.
	CO4	Execute the console, window application and crystal reports.
	CO5	Apply the connectivity to retrieve the data from database.

LIST OF PRACTICAL PROGRAMS

1. Perform stack operation using Console Application
2. Perform Matrix Multiplication using Arrays Concept in Console Application
3. Program to simulate a simple calculator in Windows Application.
4. Program to simulate a digital clock with reset option in Windows Application.
5. Program for a notepad application in Windows Application.
6. Program to maintain student details in Windows Application.
7. Design a website to display your bio-data using ASP.Net.
8. Design a website with login control using ASP.net
9. Design a website to maintain employee salary details using ASP.net
10. Develop a Simple Project for Hotel Management using front end and backend and create a Crystal report.
11. ***Case Study:*** Stock Management System using Database.

Sub. Code : **24UCT4CO**

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/ Form 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	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: **24UCT4A4**

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
2024 - 2025	4	60	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 **12 Hours**

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 **12 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).

UNIT III **12 Hours**

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

Sub. Code: **24UCT4A4**

UNIT IV **12 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 **12 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 BOOK

1. S. Salivahanan, S.Arivazhagan, (2007), **Digital Circuits and Design**, 3rd Edition.

REFERENCE BOOK

1. 1 Morris Mano, (2011), **Digital Logic and Computer Design**, Thirteenth impression, TataMcGraw Hill Publication. (UNIT I, II and III)
2. Leach Malvnio, (2005), **Digital Principles & Application** , Fifth Edition, Tata McGraw Hill 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	S	M	S	S

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

Sub. Code: **24UCT505**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Paper 5 – PHP**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2024 - 2025	6	90	5	

Course Objectives

1. To understand the basic concept of website requirements and to realize the basic requirements of PHP.
2. To learn the concepts of PHP and Data base through various PHP and SQL Statements.
3. To get the overall idea about PHP and SQL and able to get the knowledge about Website development.

Course Outcomes (CO)

K1 to K5	CO1	Remember the basic web development requirements and PHP concepts.
	CO2	Understand the PHP program flow, arrays, string and functions.
	CO3	Apply classes, Cookies, Sessions, OOPs and File concepts.
	CO4	Review the concepts of SQLite and PHP Statements.
	CO5	Evaluate the usage of various XML Technologies and Databases

Syllabus

UNIT I **18 Hours**

Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators.

UNIT II **18 Hours**

Controlling Program Flow: Writing Simple Conditional Statements – Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.

Sub. Code: **24UCT505**

UNIT III **18 Hours**

Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations - Using Arrays with Forms – Working with Array Functions – Working with Dates and Times. Using Functions and Classes: Creating User – Defined Functions – Creating Classes – Using Advanced OOP Concepts.

UNIT IV **18 Hours**

Working with Files and Directories: Reading Files – Writing Files – Processing Directories. Working with Databases and SQL: Introducing Databases and SQL- Creating and Populating a Database - Using PHP's SQLite Extension – Introducing SQLite – Retrieving Data – Adding or Modifying Data – Handling Errors –Using PHP's PDO Extension – Retrieving Data – Adding and Modifying Data –**Switching to a Different Database***.

UNIT V **18 Hours**

Working with XML : Introducing XML – XML Basics – Anatomy of an XML Document – Well-Formed and Valid XML – XML Parsing Methods* – XML Technologies – Simple XML and DOM Extensions.

***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. Vikram Vaswani, (2008), PHP – A Beginner's Guide, **Tata Mc Graw–HillPublication.**

REFERENCE BOOKS

1. Steven Holzner, (2007), **The PHP Complete Reference**, Tata McGraw–Hill Publication.
2. Steven Holzer (2005), **Spring into PHP 5**, Addison Wesley Publication.

Sub. Code: **24UCT505**

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: **24UCT506**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Paper 6 – Computer Networks**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2024 - 2025	5	75	5	

Course Objectives

1. To provide the concepts and fundamentals of different layers used in computer networking.
2. 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: **24UCT506**

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: **24UCT507**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Paper 7 – Operating Systems**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2024 - 2025	6	90	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 **18 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 **18 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: **24UCT507**

UNIT III **18 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 **18 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 **18 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)

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.

Sub. Code: **24UCT507**

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 : **24UCT5CP**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Practical 5 – PHP Programming Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2024 - 2025	6	90	2	

Course Objectives

1. To be able to get the knowledge about platform independent language.
2. To get the idea about PHP and backend connectivity concepts.
3. To be able to design their own website.

Course Outcomes (CO)

K3 to K5	CO1	Execute array functions, file and directory functions, date and time functions in PHP Script.
	CO2	Inspect PHP expressions, Cookies and Sessions.
	CO3	Apply various predefined functions.
	CO4	Develop the programs using Tokenizer.
	CO5	Evaluate the database using PHP's with backend extensions

LIST OF PRACTICAL PROGRAMS

1. Write a PHP Program using controls and functions.
2. Write a PHP program to demonstrate use of various built in string functions
3. Write a PHP Program and check message passing mechanism between Pages.
4. Write a PHP Program using string functions and arrays.
5. Write a PHP Program using date and time functions.
6. Write a PHP Program to print all the values of an indexed array
7. Write a PHP Program to print all the values of an associative array
8. Develop a PHP Program to display student information using MYSQL table
9. Develop a PHP Program to design a college application form using MYSQL table.
10. Create a PHP Program for login page without SQL function
11. Create a PHP Program for login page using SQL function and display the user name and password in another page, also include the forgot password to retrieve the new password
12. Develop a PHP Program using parsing functions (Use Tokenizing).
13. Develop a PHP Program and check Regular Expressions
14. Develop a PHP Program and check file system functions.
15. Develop a PHP Program using session.
16. Develop a PHP Program using cookies.
17. ***Case Study:*** Library Management System.

Sub. Code : **24UCT5CP**

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: **24UCT608**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Paper 8 – Software Engineering and Testing**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2024 - 2025	5	75	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 **15 Hours**

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

UNIT II **15 Hours**

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

.

UNIT III **15 Hours**

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

Sub. Code: **24UCT608**

UNIT IV — 15 Hours

Types of testing: White box testing-Black Box Testing: What, 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 — 15 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.(Units I, 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: **24UCT608**

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: **24UCT609**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Paper 9 – Python Programming**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2024 - 2025	5	75	5	

Course Objectives

1. To understand the basic concepts of Python Programming.
2. To understand complex data types and tuple.
3. To understand and implement various python packages and Tkinter

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	Demonstrate the use of built-in functions to navigate the file system
	CO5	Appraise the need for working on GUI.

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.

UNIT II **15 Hours**

Python Program Flow Control Conditional blocks: if, else and else if, 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.

UNIT III **15 Hours**

Python Complex data types: Using string data type and string operations, Defining list and list slicing, Use of Tuple data type. String, List and Dictionary, Manipulations Building blocks of python

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programs, string manipulation methods, List manipulation. Dictionary manipulation, Programming using string, list and dictionary in-built functions. Python Functions, Organizing python codes using functions.

UNIT IV **15 Hours**

Python File Operations: Reading files, Writing files in python, Understanding read functions, read(), readline(), readlines(). Understanding write functions, write() and writelines() Manipulating file pointer using seek Programming, using file operations. Database Programming: Connecting to a database, Creating Tables, INSERT, UPDATE, DELETE and READ operations, Transaction Control, Disconnecting from a database, Exception Handling in Databases.

UNIT V **15 Hours**

Python packages: Simple programs using the built-in functions of packages matplotlib, numpy, pandas etc. GUI Programming: Tkinter introduction, Tkinter and Python Programming, **Tk Widgets***, Tkinter examples. Python programming with IDE.

***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. Charles Dierbach, **"Introduction to Computer Science using Python",** Wiley, 2015

REFERENCE BOOKS

1. Jeeva Jose &P.SojanLal, "Introduction to Computing and Problem Solving with PYTHON", Khanna Publishers, New Delhi, 2016
2. Downey, A. et al., "How to think like a Computer Scientist: Learning with Python", John Wiley, 2015
3. Mark Lutz, "Learning Python", 5th edition, Orelly Publication, 2013, ISBN 978- 1449355739

Sub. Code: **24UCT609**

4. John Zelle, “Python Programming: An Introduction to Computer Science”, Second edition, Course Technology Cengage Learning Publications, 2013, ISBN 978- 1590282410

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 : **24UCT6CQ**

Programme Code : 11		**B. Sc Computer Technology**		
Title of the Paper: **Core Practical 6 – Python Programming Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Skill Development
2024 - 2025	5	75	2	

Course Objectives

1. To gain knowledge about the fundamentals of python programming.
2. To understand the concepts of string, list, tuple.
3. To implement the concept of exception handling, classes and objects.

Course Outcomes (CO)

K3 to K5	CO1	Implement basic operators and function concepts.
	CO2	Review various string and list methods.
	CO3	Execute exception handling.
	CO4	Develop the programs using tuple and dictionaries.
	CO5	Evaluate the usage of classes and attributes in python programs.

LIST OF PRACTICAL PROGRAMS

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

2.Write a Python program to perform following operations on Lists:

A) Create List B) Access List

C) Update List (Add item, Remove Item) D) Delete List

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

A) Create Tuple B) Access Tuple

C) Update Tuple D) Delete Tuple

4.Write a Python program to perform following operations on Tuples:

A) Create Set B) Access Set elements

C) Update Set D) Delete Set

5.Write a Python program to perform following operations on Dictionaries:

A) Create Dictionary B) Access Dictionary

C) Update Dictionary D) Delete Dictionary

Sub. Code: **24UCT6CQ**

6.Write Python program to demonstrate use of Control Statements.

7.Develop user defined python function for given problem :

A) Function with minimum 2 Arguments

B) Function returning values

8.Write a program to build a simple Student Management System using Python which can perform the following operations:

A. Accept
B. Display
C. Search
C. Delete
D. Update

9.Write a python program to handle user defined exception for given problem.

10.Write a python program to copy the Content of first file to second file.

11.Write python program to demonstrate use of

A Build -in Packages (e.g. NumPy, Pandas)

B User defined Packages

12. Simple GUI Calculator using Tkinter.

13. Simple Registration Form using Python Tkinter.

14. ***Case Study:*** Student Application Form

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

Sub. Code : **24UCT6CQ**

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 : **24UCT6CR**

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
2024 - 2025	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 : **24UCT6CQ**

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 : **24UCT6Z1**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Core Project – Project and Viva - Voce *****				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability/ Skill Development/ Entrepreneurship
2024 - 2025	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 - Cloud Computing**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability/ Entrepreneurship
2024 - 2025	5	75	5	

Course Objectives

1. To understand the basic knowledge about the cloud computing techniques and architecture.
2. To gain knowledge of cloud services and cloud security.
3. To be able to understand Cloud Segment, Cloud Deployment models and key cloud companies.

Course Outcomes (CO)

K1 to K5	CO1	Identify the architecture and infrastructure of cloud computing including SaaS, PaaS, IaaS, public cloud, private cloud, and hybrid cloud.
	CO2	Understand the core issues of cloud computing, security, privacy, and interoperability.
	CO3	Apply the appropriate technologies and approaches for the related issues in Cloud Computing.
	CO4	Analyze the suitable cloud computing solutions and recommendations according to the applications used.
	CO5	Evaluate the usage of security tools in clouds.

Syllabus

UNIT I **15 Hours**

Introduction - cloud computing at a glance – Historical development – Building cloud computing environment.

UNIT II **15 Hours**

Principles of parallel and distributed computing – Eras of computing – parallel vs distributed computing – Elements of parallel computing – Elements of distributed computing – **Technologies for distributed computing***.

UNIT III **15 Hours**

Cloud computing architecture: Introduction – Cloud reference model – Types of clouds – Organizational aspects.

UNIT IV **15 Hours**

Cloud Applications: Scientific applications: Healthcare – Business and Consumer Applications: CRM and ERP – Media Applications – **Multiplayer Online gaming*.**

UNIT V **15 Hours**

Cloud Security – Cloud Computing Concept – Cloud Risk – Cloud Security Tools and Techniques – Data Production in Cloud – Cloud Storage – Data Loss Prevention – Cloud Application Security – Security Assertion Markup Language.

***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. Rajkumar Buyya, Christian Vecchiola , Thamarai selvi, (2013), **Mastering Cloud Computing**, Mc Graw Hill Publication. (Units I to IV)
2. Charles P.Pfleeger, Shari Lawrence Pfleeger, Deven N.Shan, (2007), **Security in Computing**,Fourth Edition, Prentice Hall Publication. (Unit V)

REFERENCE BOOK

1. Judith Hurwitz, Robin Bloon, (2009), **Cloud Computing for Dummies**

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 – Internet of Things**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability/ Entrepreneurship
2024 - 2025	5	75	5	

Course Objectives

1. To learn the concepts of IoT and its protocols.
2. To learn how to analysis the data in IoT.
3. To develop IOT infrastructure for popular applications.

Course Outcomes (CO)

K1 to K5	CO1	Analyzing and evaluate the data received through sensors in IoT.
	CO2	Design and develop smart city in IoT.
	CO3	Analyze various communication protocols for IoT.
	CO4	Analyze applications of IoT in real time scenario.
	CO5	Evaluate appropriate protocol for communication between IoT.

Syllabus

UNIT I **15 Hours**

Introduction to IoT - Genesis of IoT- IoT and Digitization - IoT Impact -Convergence of IT and OT - IoT Challenges - IoT Network Architecture and Design -Drivers Behind New Network Architectures - Comparing IoT Architectures - Additional IoT Reference Models.

UNIT II **15 Hours**

The Core IoT Functional Stack - IoT Data Management and Compute Stack - Fog Computing - Edge Computing - The Hierarchy of Edge, Fog, and Cloud - Smart Objects - The Things in IoT - Sensors, Actuators, and Smart Objects- Sensor Networks-Wireless Sensor Networks - Communication Protocols for Wireless Sensor Networks.

UNIT III **15 Hours**

Connecting Smart Objects - Communications Criteria - IoT Access Technologies - Standardization and Alliances - Competitive Technologies - IEEE 802.15.4 - IEEE 802.15.4g and 802.15.4e - IEEE 1901.2a - IEEE 802.11ah- LoRaWAN - NB - IoT and Other LTE Variations.

UNIT IV **15 Hours**

IP as the IoT Network Layer - The Business Case for IP - Optimizing IP for IoT - Authentication and Encryption on Constrained Nodes - ACE - DICE - Application Protocols for IoT - The Transport Layer - IoT Application Transport Methods - SCADA - Generic Web - Based Protocols - IoT Application Layer Protocols - CoAP.

UNIT V **15 Hours**

IoT in Industry - Transportation- Transportation Challenges - IoT Use Cases for Transportation - An IoT Architecture for Transportation- Extending the Roadways IoT Architecture to Bus Mass Transit - Extending Bus IoT Architecture to Railways - **Public Safety*-** Public and Private Partnership for Public Safety IoT - An IoT Blueprint for Public Safety Emergency Response IoT Architecture - **School Bus Safety*** - School Bus Safety Network Architecture.

***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. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry (2017), **IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things**, Cisco Press

REFERENCE BOOKS

1. Arshdeep Bahga, Vijay Madisetti (2015), **Internet of Things – A hands-on approach**, Universities Press.
2. Olivier Hersent, David Boswarthick, Omar Elloumi (2012) , **The Internet of Things – Key Applications and Protocols**, Wiley.
3. Honbo Zhou (2012), **The Internet of Things in the Cloud**: A Middleware Perspective, CRC Press.

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
2024 - 2025	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
2024 - 2025	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
2024 - 2025	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
2024 - 2025	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 :**24UGC3S1**

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
2024 - 2025	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 :**24UGC3S1**

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 :**24UGC3S1**

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/

MAPPING

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

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

Sub Code: **24UGC3S1**

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 **: 24UCT4SL**

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
2024 - 2025	2	30	3	

Course Objectives

1. To learn and understand database programming paradigms.
2. To learn and understand oracle , MS Access 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, MS Access 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

MS Access:

1. Create student database and execute DML Commands.
2. Create a Employee database and apply conditional queries.
3. Create Database for Stock maintenance and generate Report.

ORACLE:

4. 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.
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".

Sub. Code **: 24UCT4SL**

- Display the employee name ,who are all coming from city “Coimbatore” and pin 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

8. 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

9. 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
10. 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.

Sub. Code **: 24UCT4SL**

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

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 **: 24UBI6S3**

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
2024 - 2025	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 **: 24UBI6S3**

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/ Flipped Class / Peer Learning/ Experiential Learning / Blended learning

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 **: 24UBI6S3**

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.

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 **: 24UCT5XL**

Programme Code : 11	**B. Sc Computer Technology**			
Title of the Paper: **Extra Departmental Course - Web Development and Google App Lab**				
Batch	**Hours / Week**	**Total Hours**	**Credits**	Employability
2024 - 2025	2	30	3	

Course Objectives

1. To understand the knowledge about web development languages.
2. To gain knowledge about Website creation.
3. To get knowledge about various Google Applications.

Course Outcomes (CO)

K3 to K5	CO1	Implement various HTML tags and develop web pages.
	CO2	Review different HTML tags and its usages.
	CO3	Assess the functionality of Google Doc and Google Sheet.
	CO4	Review the functionality of Google Slide and Forms.
	CO5	Explore the usage of Google Apps.

LIST OF PRACTICAL PROGRAMS

1. Design a small webpage using formatting tags.
2. Design a webpage and display images.
3. Create a web page and display your Qualification using Tables.
4. Create User authentication page.
5. Design a Webpage and display the Biodata.
6. Create your department website.
7. To perform various operations using Google Doc.
8. To perform various operations using Google Sheet.
9. To prepare slide using Google Slides.
10. To prepare online Feedback using Google forms.

Sub. Code **: 24UCT5XL**

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

MAPPING

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

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

Sub Code : **: 24EVS101**

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
2024 - 2025	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 : **24EVS101**

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 : **24EVS101**

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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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 : **: 24VED201**

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
2024 - 2025	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 **: 24VED201**

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 : **24UHR3N1**

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
2024 - 2025	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: **24UHR3N1**

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 : **24UHR3N1**

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 : **24UWR4N2**

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
2024 - 2025	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: **24UWR4N2**

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.

Question Paper Pattern

Sub. Code : **24UWR4N2**

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
2024 - 2025	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) ConsumerAffairs, 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 andConcerns, 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)

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

Section B (5X10=50)

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