KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE–641029

DEPARTMENT OF COMPUTER SCIENCE [AIDED]

CURRICULUM AND SCHEME OF EXAMINATIONS

(CBCS)(2024-2025)

KONGUNADU ARTS AND SCIENCE COLLEGE(AUTONOMOUS)
Coimbatore–641029

Vision:

Developing the total personality of each and every student in a holistic way by adhering to the principles of Swami Vivekananda and Mahatma Gandhi.

Mission:

- Imparting holistic and man-making education with emphasis on character, culture and values - moral and ethical.
- Designing the curriculum and other courses that transform its students into value added and skilled human resources.
- Constantly updating academic and management practices towards total quality management and promotion of quality in all spheres.
- Extending the best student support services by making them comprehensive and by evolving a curriculum relevant to student community and society at large.
- Taking steps to make education affordable and accessible by extending scholarships to the meritorious and economically disadvantaged students.
- Motivating teachers in such a way that they become the role models in promoting Higher Education.

DEPARTMENT OF COMPUTER SCIENCE

Vision:

To inculcate Human, Moral and ethical values in the young minds of the students and thereby improving the total personality of the students.

Mission:

- To produce employable graduates to cater the needs of various industries.

PROGRAMME OUTCOMES (PO)

PO1	Understand the basic concepts, fundamental principles and scientific theories that are needed for higher learning and research.
PO2	Identify, formulate and analyze the complex situations to arrive acceptable solutions by applying domain specific knowledge, acquired through the programme.
PO3	Learn moral and ethical values and commit to professional ethics and responsibilities in the associated disciplines. Exercise social concern with the ability to act with awareness of issues in diversified domains to participate in the national development.
PO4	Ability to design, implement and evaluate a computational system to meet the desired needs within realistic constraints.
PO5	Realize the need for self and life-long learning to move along with the scientific and technological developments.
PO6	Ability to communicate and engage effectively with diverse stakeholders.
PO7	Analyze the impacts of computing on individuals, organizations and society.
PO8	Acquire skills of observing and drawing logical inferences from the scientific facts.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1	Impart the core knowledge in the areas such as Software Engineering, Data Communication, Networking and Security, Database Management, Web Technology, Operating System, Artificial Intelligence and other emerging areas in Computer Science.
PSO2	Provide well trained professionals to industries by enhancing the programming skills and new computing technologies through theoretical and practical knowledge.
PSO3	Train to solve real world problems by selecting appropriate techniques and best logic.
PSO4	Enhance the ability to design and develop software applications, to understand the basic concepts of hardware and to comprehend and apply mathematical and accounting principles.
PSO5	Make use of Computer Science techniques to one's own work as a member or a leader in a team to arrive conclusions and carryout projects.

UCS 1

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

COIMBATORE – 641 029

Programme Name : B.Sc., Computer Science (Aided)

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 ofExam (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	24UCS101	Core Paper 1 – C Programming	4	25	75	100	3	4
	III	24UCS1CL	Core Practical 1 - C Programming Lab	6	40	60	100	3	2
	III	24UCS1A1	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	-	
II	I	24TML202	Language II@	6	25	75	100	3	3
	II	24ENG202	English –II	6	25	75	100	3	3
	III	24UCS202	Core Paper 2 – Object Oriented Programming with C++	4	25	75	100	3	4
	III	24UCS2CM	Core Practical 2 - Object Oriented Programming with C++ Lab	6	40	60	100	3	2
	III	24UCS2A2	Allied Paper 2 – Operations Research	6	25	75	100	3	5
	IV	24VED201	Value Education- Moral and Ethics**	2	-	50	50	3	2
	-	-					550		
			Total	**30**	-	-		-	
III	I	24TML303	Language III@	6	25	75	100	3	3
	II	24ENG303	English –III	6	25	75	100	3	3
	III	24UCS303	Core Paper 3 – JAVA Programming	4	25	75	100	3	5
	III	24UCS3CN	Core Practical 3 – JAVA Programming Lab	6	40	60	100	3	2
	III	24UCS3A3	Allied Paper 3 – Data Structures	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 - Human Rights**	2	-	75	75	3	2
			Total	**30**	-	-	675	-	
IV	I	24TML404	Language IV@	6	25	75	100	3	3
	II	24ENG404	English –IV	6	25	75	100	3	3
	III	24UCS404	Core Paper 4 – Data Base Management System	4	25	75	100	3	5
	III	24UCS4CO	Core Practical 4 – Visual Basic and Oracle Lab	6	40	60	100	3	2
	III	24UCS4A4	Allied Paper 4 – Digital Principles and Computer System Architecture	4	25	75	100	3	5
	IV	24UCS4SL	Skill Based subject 2- Mobile Application Development Lab	2	40	60	100	3	3
	IV	24TBT402/ 24TAT402/ 24UWR4N2	Basic Tamil* / Advanced Tamil**/ Non-major elective- II - Women' s Rights **	2	-	75	75	3	2
			Total	**30**	-	-	675	-	
V	III	24UCS505	Core Paper 5 – Artificial Intelligence	6	25	75	100	3	6
	III	24UCS506	Core Paper 6 – Python Programming and IoT	5	25	75	100	3	5
	III	24UCS5CP	Core Practical 5– Python Programming and IoT Lab	6	40	60	100	3	2
	III	24UCS507	Core Paper 7 – Data Communication and Networking	6	25	75	100	3	5
	III	24UCS5E1	Major Elective 1	5	25	75	100	3	5
	IV	-	**EDC**	2	100	-	100	3	3
	-	**24UCS5IT**	**Internship Training ******				Grade		
			Total	**30**			600		

VI	III	24UCS608	Core Paper 8 – Data Analytics	4	25	75	100	3	4
	III	24UCS609	Core Paper 9 – PHP Programming	4	25	75	100	3	5
	III	24UCS6CQ	Core Practical 6 - PHP Programming Lab	6	40	60	100	3	2
	III	24UCS610	Core Paper 10 – Information Security	5	25	75	100	3	5
	III	24UCS6E2	Major Elective 2	5	25	75	100	3	5
	III	24UCS6Z1	Project Work and Viva-Voce***	4	20	80	100	-	5
	IV	24UCS6S3	Skill Based subject 3- Basics of IPR	2	25	75	100	3	3
			Total	**30**	-	-	700	-	
	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 – 23HIN/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

**** The students shall undergo Internship training / field work for a minimum period of 14 working days at the end of the fourth semester during summer vacation and submit the report in the fifth semester which will be evaluated for 100 marks by the concerned guide and followed by an Internal Viva voce by the respective faculty or HOD as decided by the department. 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. Software Engineering and Testing
3. Embedded Systems
4. Systems Software and Operating Systems
5. Mobile Computing
6. Machine Learning

Non-Major Elective Papers

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

UCS 3

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

24UCS5XL - Web Designing using HTML

 # 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 creditsand marks for core/allied subjects remain the same as stated below.

Tally Table:

S.No.	Part	Subject	Marks	Credits
1.	I	Language – Tamil/Hindi/Malayalam/ French/ Sanskrit	400	12
2.	II	English	400	12
3.	III	Core – Theory/Practical	1600	60
	III	Allied	400	20
		Electives/Project	300	15
4.	IV	Basic Tamil / Advanced Tamil (OR) Non-major electives	150	4
		Skill Based subject	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 paper.
- 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 the **Naan Mudhalvan** courses in the 3rd and 5th semester will be given 2 extra credits for each course. They are asked to submit the marks to the Controller of Examinations through and undersigned by the HOD.

Semester	Naan Mudhalvan Course Title
III	Cloud administration and foundation in AWS
V	Data Analytics using Tableau and Siemens Insight Hub.

UCS 4

Components of Continuous Internal Assessment

Components		Marks	Total
Theory			
CIA I	75	(75+75) Converted to 15	25
CIA II	75		
Assignment		5	
Seminar		5	
Practical [Core]			
CIA Practical		25	40
Observation Notebook		10	
Record		5	
Practical[Skill Based Subject]			
CIA Practical		25	40
Observation Notebook		10	
Record		5	
Project/Case study			
Review		15	20
Regularity		5	

UCS 5

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

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

1.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	

1.ESE Practical Examination:

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

Knowledge Level	Section [Skill Based Subject]	Marks	Total
K3	Experiments	50	60
K4	Record Work	10	
K5			

2.ESE Project Viva Voce:

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

UCS 6

Sub Code: 24UCS101

ProgrammeCode:**09**	**B.Sc., Computer Science**			
Title of the Paper :	**Core Paper 1 – C Programming**			
Batch **2024-2025**	Hours/Week **4**	Total Hours **60**	Credits **4**	Skill development

Course Objectives

1 . To gain 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 get exposure to problem-solving through C programming.

Course Outcomes (CO)

K1 to K5	CO1	Remember various programming constructs and to develop C programs.
	CO2	Understand the fundamentals of C programming.
	CO3	Apply the right data representation formats based on the requirements of the problem.
	CO4	Analyze the different Operations on arrays, functions, pointers, structures,unions and files.
	CO5	Evaluate the concepts learnt through implementing and testing of the programs that are developed.

Syllabus

UNIT I **[12 Hours]**

Introduction to C – Overview of Compilers and Interpreters – Structure of C Program-Programming Rules- Character Set – Keywords – Variables – Data types – Type Conversion – Constant and Volatile Variables. Operators and Expressions : Priority of operators – Arithmetic, Relational, Logical, Assignment, Increment / Decrement, Conditional, Bitwise and Special Operators. I/O in C : Formatted ,Unformatted , Library Functions.

UNIT II **[12 Hours]**

Decision Statements: if, if/else, switch, break, continue, goto. Loop Control Statements: Introduction – for, nested for loops- while, do-while statements.

UNIT III **[13 Hours]**

Arrays: Introduction – Definition – 1D, 2D, 3D or Multi Dimensional Arrays.Strings: Standard Functions - Application of Strings. Pointers: Features – Declaration – Pointer and Arrays– Array of Pointers – Pointers to Pointers – Pointers and Strings – Void Pointers.

UCS 7 **Sub Code: 24UCS101**

UNIT IV **[12 Hours]**

Functions: Definition- Declaration – Types of Functions – Call byValue – Call by reference – Recursion – Pointer to Function. **Storage Class: Automatic, External, Static, Register variables***. Structure and Union: Introduction – Declaration and initialization – **Union***.

UNIT V **[11 Hours]**

Files: Streams and File Types - Steps for File Operations – File I/O – Other File Function – Command Line Arguments – Application of Command Line Arguments. Programming embedded systems in C: Introduction - What is an embedded system? - Which programming language should you use? – Which operating system should you use? - How do you develop embedded software?

* - 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. Ashok N Kamthane (2002), "**Programming with ANSI and Turbo C"**, 1st Edition, Pearson Education Publications.
2. Michael J. Pont (2002), **"Embedded C"**, Pearson Education Publications (Chapter 1 Only).

Reference Books :

1. E .Balagurusamy(1998), **"Programming in ANSI C",** TMH publications.
2. HenryMullish & Herbert L Cooper **(**1996), "**The Spirit of C",** Jaico Publication House.

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	S	S	S	H
CO4	S	S	H	H	H
CO5	S	S	S	H	H

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

UCS 8 **Sub Code: 24UCS1CL**

ProgrammeCode:**09**	**B.Sc., Computer Science**			
Title of the Paper :	**Core Practical 1 – C Programming–Lab**			
Batch **2024-2025**	Hours/Week **6**	Total Hours **90**	Credits **2**	Employability

Course Objectives

1. To understand the field of programming using C language.
2. To familiarize the fundamental syntax and semantics of C language.
3. 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 programming skills using the fundamentals and basics of C Language.
	CO2	Develop programs using the basic elements like control statements, Arrays and Strings
	CO3	Enable effective usage of arrays, structures, functions and pointers.
	CO4	Implement files and command line arguments.
	CO5	Evaluate the ideas and concepts using testing of the programs

LIST OF PRACTICAL PROBLEMS

1. Write a programto find the sum, average, standard deviation for a given set of numbers.
2. Write a program to generate 'n' prime numbers.
3. Write a program to find the biggest number among a set of numbers.
4. Write a program to arrange a set of numbers in ASCENDING ORDER using BUBBLE SORT.
5. Write a program to merge a set ofnumbers available in Two Arrays into a Single Array.
6. Write a program to calculate the sine value and compare it with built-in function. [$x - x^3/3! + x^5/5! \ldots\ldots$]
7. Write a Recursive function to calculate factorial to compute nCr value.
8. Write a programto find the number of palindromes in a given sentence.

UCS 9 **Sub Code: 24UCS1CL**

9. Write a function to perform
   i) String Copy
   ii) String Concatenation
   iii) String Reverse.
10. Write a program to implement LINEAR SEARCH and find a particular name in the list of names.

11. Write functions for following STACK operations:
   i) PUSH
   ii) POP
   iii) DISPLAYING STACK

12. Write a generalized program to perform Matrix Addition.

13. Write a program to print mark sheet of a student assuming rno, name, marks in 5 subjects in a structure. Create an array of structures and print the mark sheet in the university pattern.

14. Write a program to display the content of an array using pointers.

15. Write a program which takes a file as command line argument and copy it to another file.

16. Write a C program to display month by month calendar for a given year.

17. Write a C program to Read/Write structure to a file.

18. Write a C program to check if a String is Palindrome using pointers

Teaching Methods

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

Guidelines to the distribution of marks for Practical Examinations:

Two Questions will be given for each student. (3 Hours / **60Marks**)

Record: **10 Marks**

Particulars	**Program1 (Marks)**	**Program2 (Marks)**
Algorithm	**10**	**10**
Program Coding	**10**	**10**
Execution	**5**	**5**

MAPPING

PSO / CO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	S	S	H
CO4	S	S	H	H	H
CO5	S	S	H	H	S

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

UCS 10

Sub Code: **24UCS202**

ProgrammeCode:**09**	**B.Sc., Computer Science**			
Title of the Paper :	**Core Paper2– Object Oriented Programming with C++**			
Batch **2024-2025**	Hours/Week **4**	Total Hours **60**	Credits **4**	Skill development

Course Objectives

1. To understand and differentiate the Procedure Oriented Paradigm and Object Oriented Paradigm .
2. To acquire knowledge about Classes, Objects, Inheritance and Polymorphism
3. To develop and implement the programs using Object Oriented concepts .

Course Outcomes (CO)

K1 to K5	CO1	Remember the characteristics of Procedure and Object Oriented Programming Languages
	CO2	Understand the fundamentals of C++ programming structure, function overloading and constructors.
	CO3	Apply C++ features such as composition of objects ,Operator overloading, inheritance,Polymorphism etc., to develop programs.
	CO4	Analyze the concepts of object oriented programming in terms of software reuse and managing complexity to solve real-world problems.
	CO5	Evaluate the concepts learnt through implementing and testing of the programs that are developed.

Syllabus

UNIT I **[12 Hours]**

Introduction to C++ - Key concepts of OOP – advantages – OOP languages –I/O in C++. C++ declarations. Control structures: Decision making statements: if..Else, jump, goto, break,continue, Switch case statements. **Loops in C++: for, while, do..while loops*-**Functions in C++- inline Functions- function overloading.

UNIT II **[12 Hours]**

Classes and Objects : Declaring objects – defining member functions- static member variables and functions – array of objects – friend functions – overloading member functions – constructors and destructors – Note: Unit 2 and 3 refers to the Consumer Protection Act, 2086. Any change in law would be added .

UNIT III **[12 Hours]**

Operator overloading: overloading unary, binary operators – overloading friend function- type conversion . Inheritance: Types of Inheritances – Single, multilevel, multiple, hierarchical, hybrid, Multipath inheritance- virtual base classes – abstract classes.

UCS 11 **Sub Code: 24UCS202**

UNIT IV **[12 Hours]**

Pointers-Declaration-Pointer to class, object-this pointer – Pointer to derived classes and base classes- Arrays- characteristics – arrays of classes –Binding ,Polymorphism and Virtual Functions.

UNIT V **[12 Hours]**

Files – File Stream classes – File modes – Sequential File Read/Write operations –Templates – Exception handling – **Strings and String Functions *.**

* - 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. Ashok N Kamthane **(**2003), **"Object oriented Programming with Ansi and Turbo C++",** 1st Edition,Pearson Education Publication.

Reference Books:

1. E.Balagurusamy (1998), **"Object oriented programming with C++",** TMH Publication.
2. Maria Litvin & Gary Litvin **(**2002), **"C++ for you",** Vikas Publication.
3. John R Hubbard (2002), **"Programming with C++",** 2nd Edition,TMH Publication.

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	H	H	S	H
CO4	S	S	S	S	M
CO5	S	S	S	H	H

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

UCS 12 **Sub Code**: **24UCS2CM**

ProgrammeCode:**09**	**B .Sc ., Computer Science**			
Title of the Paper : Core Practical 2 – Object Oriented Programming with C++ - Lab				
Batch **2024-2025**	Hours/Week **6**	Total Hours **90**	Credits **2**	Employability

Course Objectives

1. To write programs using operators and data structure concepts .
2. To develop programs using Overloading of operators and Virtual functions.
3. To understand the implementation of File concepts.

Course Outcomes (CO)

K3 to K5	CO1	Apply the concepts of object oriented programming.
	CO2	Examine the string functions to perform operator overloading,
	CO3	Analyze the virtual functions and inheritance.
	CO4	Illustrate the file concepts and command line arguments.
	CO5	Evaluate the ideas and concepts using testing of the programs

LIST OF PRACTICAL PROBLEMS

1. Create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the stack to 0. Write a member function PUSH( ) to insert an element and a member function POP( ) to delete an element. Check for overflow and underflow conditions.

2. Create a class ARITH which consists of a FLOAT and an INTEGER variable . Write member functions ADD( ) , SUB( ) , MUL( ) , DIV( ) , MOD( ) to perform addition ,multiplication, division and modulus respectively. Write member functions to get and display values.

3. Create a class MAT to represent 2D matrix with R & C representing the rows and columns of the matrix. Overload the operators +,-,* to add, subtract and multiply two matrices .Write member functions to get and display MAT object values.

4. Write a program to define Class A, B and C. The Class C is derived from A and B. Defining count() member function in all the classes as virtual, count the number of objects created.

5. Define a Class to represent a Bank Account. Include the followingmembers:

   1. Name of the depositor.
   2. Account number.
   3. Type of account.
   4. Balance amount.

UCS 13 **Sub Code: 24UCS2CM**

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Member functions:

1. To assign initial values.
2. To deposit an amount.
3. To withdraw an amount after checking balance.
4. To display name and balance.
5. Write a main program using the above details.
6. Write a program to implement Destructors.
7. Write a program to implement Multilevel Inheritance.
8. Write a program to overload member functions in Base and Derived class.
9. Create a class STRING. Write member functions to initialize , get and display strings . Overload the operator + to concatenate 2 strings, == to compare 2 strings and write a member function to find the lengthof the string.
10. Create a class which consists of EMPLOYEE details like eno, ename, dept, basic salary, grade. Write member functions to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA, PF, depending on the grade and display the Payslip in a neat format using console I/O operations.
11. Create as class SHAPE which consists of two VIRTUAL FUNCTIONS Cal_Area( ) and Cal_PERI to calculate Area and Perimeter of various figures. Derive three classes SQUARE, RECTANGLE and TRIANGLE from the class SHAPE and calculate Area and Perimeter of each class separately and display the result.
12. Create two classes which consist of two private variables, one Integer and one Float variable in each class. Write member functions to get and display them. Write a FRIEND function common to these classes that adds Integer and Float values of the objects separately and display the result.
13. Write a user defined function USERFUN( ) to have the formatting commands like setw( ), showpoint, showpos, precision( ). Write a program that prints multiplication table making use of USERFUN( ) for formatting.
14. Write a program to implement the concept function with default arguments .
15. Write a program using Command Line Arguments to take 2 files as arguments and copy the contents of the first file in to the second file with line numbers.
16. Write a C++ Program to Store Information of a Student in a Structure
17. Write a C++ Program to print Inverted Pyramid Pattern
18. Write a C++ Program to check if a given year is leap year

Teaching Methods

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

UCS 14

Sub Code: 24UCS2CM

Guide lines to the distribution of marks for Practical Examinations:

Two Questions will be given for each student. (3Hours/60 marks)

Record: **10 Marks**

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	**10**	**10**
Program Coding	**10**	**10**
Execution	**5**	**5**

MAPPING

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S
CO2	S	S	H	S	S
CO3	S	H	H	H	H
CO4	S	S	H	H	H
CO5	S	S	H	S	S

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

UCS 15

Sub Code: **24UCS303**

ProgrammeCode:**09**	**B. Sc .,Computer Science**			
Title of the Paper :	**Core Paper 3 – Java Programming**			
Batch **2024-2025**	Hours/Week **4**	Total Hours **60**	Credits **5**	Skill development

Course Objectives

1. To gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
2. To understand the fundamentals of object-oriented programming in Java, including managing classes, objects, invoking methods and exception handling mechanisms.
3. To know the concepts of inheritance, packages, interfaces and multithreading.

Course Outcomes (CO)

K1 to K5	CO1	Remember the fundamentals of programming such as variables, conditional statements and iterative execution statements.
	CO2	Understand the concepts of arrays, strings, packages and multithreading.
	CO3	Apply the concepts of applet programming, graphics programming and files.
	CO4	Analyze a software application using the Java programming language
	CO5	Evaluate the concepts learnt through implementing and testing of the programs that are developed.

Syllabus

UNIT I **[12 Hours]**

JAVA Evolution : History – Features – How Java differs from C and C++ - Java and Internet- Java and WWW – Web Browsers.Overview of Java Language : Introduction – Simple Java program – Structure – javaTokens – Statements-Java virtual Machine.

UNIT –II **[12 Hours]**

Constants- variables – Data types – Operators and Expressions. Decision Making and Branching: If,If..else,else..if ladder,Switch, ?: operator Decision Making and Looping : While,do,for – jumps in loops-labelled loops. Classes,Objects and Methods.

UNIT –III **[13 Hours]**

Arrays, Strings and Vectors- Interfaces:Multiple Inheritance-**Packages : Puttingclasses together *** – Multi Threaded Programming.

UNIT – IV **[11 Hours]**

Managing Errors and Exceptions–Applet programming–**Graphics programming** *.

UCS 16

Sub Code: 24UCS303

UNIT –V **[12 Hours]**

Files : Introduction – concept of streams – Stream classes – Using streams – I/O classes- File class – I/O Exceptions – creation of files- Reading/Writing characters /Bytes-Handling primitive data types – Random Access 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 Book :

1. E.Balagurusamy (2000), **"Programming with Java – A Primer"**, TMH Publications, 2nd Edition.

Reference Books:

1. Patrick Naughton and Herbert Schildt (2000)**, "The Complete Reference Java 2"**, 3rd Edition, TMH Publications.
2. C.Xavier (2000**), "Programming with Java 2",** ScitechPublications.

MAPPING

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

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

UCS 17

Sub Code : **24UCS3CN**

ProgrammeCode:**09**	**B. Sc., Computer Science**			
Title of the Paper :	**Core Practical 3 – Java Programming – Lab**			
Batch **2024-2025**	Hours/Week **6**	Total Hours **90**	Credits **2**	Employability

Course Objectives

1. To understand the object-oriented programming principles implemented through JAVA programs.
2. To know the event-driven programming methods, including creating and manipulating objects,classes, graphics concepts and applet programming.
3. To design, code, debug and implement JAVA programs.

Course Outcomes (CO)

K3 to K5	CO1	Apply the fundamentals of Java programming language in software development.
	CO2	Examine the basics of Java programming, multi-threaded programs and Exception handling.
	CO3	Analyze and use Java in a variety of applications.
	CO4	Illustrate a software application using the Java programming language.
	CO5	Evaluate the ideas and concepts using testing of the programs.

LIST OF PRACTICAL PROBLEMS

1. Write a program to create and display a message on window.
2. Write a program to draw several shapes in a created window.
3. Write a program to create an Applet and draw grid lines.
4. Write a java program to create a frame with two buttons called father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother button similar details of mother should appear.
5. Write a java program to create four text fields for the name, street, city and pincode with suitable labels. Also add a button called My Details, when you click the My Details button your name, street, city and pincode must appear in the text fields.
6. Write a Java program to create a frame with three text fields for name, age and qualification and a text field of multiple line for address.
7. Write a Java program to demonstrate multiple selection list box.

8. Write Java program to create a menu bar and pull down menus

9. Develop a Java program to create a window, when we press M or m the window displays Good Morning, **A** or a the window displays Good Afternoon, E or e the window displays Good Evening N or n the window displays Good Night.

10. Write a program to move different shapes(Circle, Ellipse, Square, Rectangle) according to the arrow keypressed.

11. Write a program to draw circle, ellipse, square, rectangle at the mouse click position.

12. Write a program to handle the divide by zero exception

13. Write a program to create an exception called payout of bounds and throw the exception.

14. Write a program to explain the multithreading with the use of multiplication tables. Three threads must be defined. Each one must create one multiplication table; they are 5 tables, 7 tables and 13 table.

15. Write a program to illustrate thread priority. Create three threads and assign three different priorities.

16. Write a java program to convert string value to byte value

17. Write a java program to convert linked list to an array

18. Write a java program to rotate an elements of an list

Teaching Methods

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

Guidelines to the distribution of marks for Practical Examinations:

Two Questions will be given for each student. (3Hours/**60** marks)

Record: **10 Marks**

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	**10**	**10**
Program Coding	**10**	**10**
Execution	**5**	**5**

UCS 19

MAPPING

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	H	H
CO2	S	S	H	S	S
CO3	S	H	H	S	S
CO4	S	S	S	M	S
CO5	S	S	M	S	S

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

UCS 20 **Sub Code: 24UCS3A3**

ProgrammeCode:**09**	**B. Sc ., Computer Science**			
Title of the Paper :	**Allied Paper 3 – Data Structures**			
Batch **2024-2025**	Hours/Week **4**	Total Hours **60**	Credits **5**	Skill development

Course Objectives

1. To know the concepts of fundamentals of writing algorithms and approach in problem solving.
2. To represent the basic concepts of stack, queue, linked list, trees and graphs.
3. To understand the concepts of searching and sorting techniques.

Course Outcomes (CO)

K1 to K5	CO1	Remember the concepts of algorithms for searching, sorting and dynamic programming.
	CO2	Understand the representations of data and various algorithm
	CO3	Apply appropriate algorithms and data structures for real time applications.
	CO4	Analyze the complexity of different algorithms
	CO5	Evaluate the special trees and Hashing Techniques

Syllabus

UNIT I **[12 Hours]**

Introduction – overview **- How to create programs and analyze them** *. Arrays – structures – ordered lists – representation of arrays – simple applications.

UNIT II **[12 Hours]**

Stacks and queues – Fundamentals – structure-operations –Multiple stacks and queues. Applications Evaluation of Expressions.

UNIT III **[12 Hours]**

Linked lists – single linked lists – Linked stacks and queues – **The storage pool * -** Applications – Polynomial addition, sparse matrices. Double Linked Lists – Dynamic storage management – **Garbage collection and compaction ***.

UCS 21 **Sub Code: 24UCS3A3**

UNIT IV **[11 Hours]**

Trees : Basic Terminology – Binary Trees – Binary Tree Representation – Applications of Trees. Searching: Binary, sequential, and Fibonacci.

UNIT V **[13 Hours]**

Sorting:– Internal sorting Insertion, quick, merge, heap, radix sorts – External sorting – Sorting with disks – K-way merging– sorting with tapes – Balanced merge - Polyphase merge. Symbol tables – Static tree – Dynamic tree – Hash tables.

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

Teaching Methods

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

Text Book:

1. Ellis Horowitz & Sartaj Sahani (1999), **"Fundamentals of Data Structures"**, Galgotia book source.

Reference Books:

1. Ashok N Kamthane (2004), **"Programming and Data Structures",** Pearson Education.
2. Robert Kruse, C.L.Jondo, Bruse Leung (2008), **"Data Structures and Program Design in C",** Pearson Education, Asia, Second Edition.

MAPPING

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

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

UCS 22

Sub Code: **24UCS404**

ProgrammeCode:**09**	**B.Sc., Computer Science**			
Title of the Paper :	**Core Paper 4 – Database Management System**			
Batch **2024-2025**	Hours/Week **4**	Total Hours **60**	Credits **5**	Skill development & Entrepreneurship

Course Objectives

1. To understand the different issues involved in the design of a database system.
2. To know the essential DBMS concepts such as: database security, integrity and normalization.
3. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling and designing a DBMS.

Course Outcomes (CO)

K1 to K5	CO1	Remember data independence, data models for database systems, database schema and database instances.
	CO2	Understand and use data manipulation language to query and manage a database.
	CO3	Analyze various database types.
	CO4	Apply normalization concepts for designing a good database with integrity constraints.
	CO5	Evaluate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization.

Syllabus

UNIT I **[11 Hours]**

Introduction: Purpose of Database Systems - View of Data - Data Models - Database Languages - Transaction Management - Storage Management Database Administrator - Database Users – Overall System Structure.

Entity Relationship Model: Basic concepts - Keys - Entity Relationship Diagram, Weak Entity sets, Extended E-R Features : Specialization, generalization.

UNIT II **[14 Hours]**

Relational Model: Relational Algebra - Views. SQL: Background - Basic Structure - Set Operations - Aggregate Functions - Null values - Derived Relations - Views - Modification of the database - Joined Relations - Data Definition Language.

UCS 23 **Sub Code: 24UCS404**

UNIT III **[12 Hours]**

Integrity Constraints: Domain Constraints - Referential Integrity - Assertions - Triggers. Functional Dependencies – Relational Database Design: Pitfalls – Decomposition-Normalization using Functional Dependencies.

UNIT IV **[12 Hours]**

Object Oriented Databases: New Database Applications - Object Oriented Data Model - Object Oriented Languages - Persistent Programming Languages.

Database System Architecture: Centralized Systems- Client/ Server Systems – Parallel Systems- Distributed Systems- Network Types.

UNIT V **[11 Hours]**

New Applications: Decision Support Systems - Data Analysis - Data Mining - Data Warehousing - Spatial and Geographic Databases – **Multimedia Databases - Mobility and Personal Databases *** - Information-Retrieval Systems - Distributed Information Systems .

***** - 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. Abraham Silberschatz, Henry F. Korth, S. Sudharshan (1997), "**DATABASE SYSTEM CONCEPTS",** Third Edition, Tata McGraw Hill International Editions.

Reference Books:

1. Alexis Leon and Mathews Leon (1999),"Database Management Systems", VikasPublications.
2. Elmasri Navathe (2006),"Database Management Systems", Pearson Education Publications, Fourth Edition.

MAPPING

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

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

UCS 24

Sub Code: 24UCS4CO

ProgrammeCode:**09**	**B.Sc Computer Science**			
Title of the Paper : Core Practical 4 – Visual Basic and Oracle Lab				
Batch **2024-2025**	Hours/Week **6**	Total Hours **90**	Credits **2**	Employability

Course Objectives

1. To develop applications using Graphical User Interface tools.
2. To understand the design concepts.
3. To design and build database systems and demonstrate their competence.

Course Outcomes (CO)

K3 to K5	CO1	Apply the concepts of Visual Basic
	CO2	Examine the various Controls in Visual Basic
	CO3	Analyze how to design and develop the event- driven applications using Visual Basic frame work.
	CO4	Illustrate the applications using the components of toolbox
	CO5	Evaluate the ideas and concepts using implementation and testing of the programs

LIST OF PRACTICAL PROBLEMS

1. Develop a Project to Scroll the text "Visual Programming Lab" from left to right and right to left on client area.

2. Develop a Project to change the shape of cursor in every cell while moving the mouse across the client area by dividing it to 8 *8 cells.

3. Using Mouse Down Event, Write a Visual Basic application to identify whether the right button or the left button was clicked

4. Develop an application to emulate a simple calculator that performs basic mathematical functions like addition, subtraction, multiplication anddivision .

5. Design a business database to maintain the following information:
   - Supplier address
   - Customeraddress
   - Types ofbusiness
   - Stock level ofbusiness

Generate a Data Report that displays the information stored in the database .

6. Develop a Project that displays the appearance of a pair of eyes using circle method.
7. Design a Project to display the images circle, square, rectangle, ellipse and fill the same.
8. Create a Visual Basic application using the Common Dialog control to display the options like Font, Save and open dialog box without using the action property of the controls.
9. Implement a Project that plots several points at random on a form with red, blue and green colors.
10. Using the Flex Grid control option, write a program that calculates addition, subtraction, multiplication, and division of numbers ranging from 1 to 12.
11. Develop a simple project in Visual Basic for Railway Reservation application.
12. Implement a Visual Basic project for Payroll Report generation .
13. Develop a simple project to maintain Attendance details of Employees.
14. Create an application to generate Mark List report of students.
15. Develop a simple project to prepare a Data Report for Telephone Billing information of subscribers.
16. Design a form to display a picture using image box/picture box selected from a file in file list box directory list box, drive list box.
17. Design a simple application using OLE control.
18. Write a php program to create an analog clock which shows all the three hands(Hours, Minutes, Seconds). You can add an option to change an background of am clock

Teaching Methods

Guidelines to the distribution of marks for Practical Examinations:

Two Questions will be given for each student. (3Hours/**60** marks)

Record: **10 Marks**

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	**10**	**10**
Program Coding	**10**	**10**
Execution	**5**	**5**

UCS 26 **Sub Code: 24UCS4CO**

MAPPING

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	H	H
CO2	S	M	H	S	S
CO3	S	S	H	M	H
CO4	S	H	S	S	S
CO5	S	S	S	H	H

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

UCS 27 **Sub Code: 24UCS4A4**

ProgrammeCode:**09**	**B.Sc., Computer Science**			
Title of the Paper : Allied Paper 4–Digital Principles and Computer System Architecture				
Batch **2024-2025**	Hours/Week **4**	Total Hours **60**	Credits **5**	Skill development

Course Objectives

1. To know the basics of computer hardware and how software interacts with computerhardware.
2. To familiarize with different numbering methods like binary, octal, and hexadecimal.
3. To understand the concepts of memory hierarchy and compare different methods for computer architecture.

Course Outcomes (CO)

K1 to K5	CO1	Remember basic structure of computer, numbering methods, arithmetic and logical operations performed by computers.
	CO2	Understand various data transfer techniques in digital computer and control unit operations.
	CO3	Apply performance issues in processor and memory design of a digital computer various data representations.
	CO4	Analyze architectures and computational designs and computer architecture concepts related to design of modern processors, memories and I/Os.
	CO5	Evaluate the performance of commercially available computers.

Syllabus

UNIT- I **[12 Hours]**

Number Systems and Codes - Binary Number System: Binary to Octal, Decimal, Hexadecimal Conversions – Decimal Number System : Decimal to Binary, Octal, Hexadecimal Conversions – Octal Number System : Octal to Binary, Decimal, Hexadecimal Conversions - Hexadecimal Number System : Hexadecimal to Binary, Octal, Decimal Conversions –ASCII Code – Excess – 3 Code – Gray Code.

UNIT- II **[11 Hours]**

Digital Logic : The Basic Gates – AND, OR, NOT – Universal Logic Gates : NAND and NOR – AND-OR-Invert Gates.

Combinational Logic Circuits : Boolean Laws and Theorems – Sum-of-Products Method - Truth Table to Karnaugh Map – Pairs, Quads and Octets – Karnaugh Simplification - Don’t Care Conditions- Product-of-Sums Method.

Sub Code: 24UCS4A4

UCS 28

UNIT – III **[12 Hours]**

Multiplexers - Demultiplexers – 1-of-16 Decoders – BCD-Decimal Decoders - Encoders – Flip-flops: RS Flip-flops- Edge-trigerred RS Flip-flops - Edge-trigerred D Flip-flops - Edge-trigerred JK Flip-flops.

UNIT – IV **[14 Hours]**

Central Processing Unit: General Register Organization - Stack Organization – Instruction Formats – Addressing Modes.

Input–Output Organization: **Peripheral Devices *** - Input-Output Interface – Asynchronous Data Transfer (strobe control & handshaking) – Priority Interrupt – Direct Memory Access – Input – Output Processor – Serial Communication.

UNIT –V **[11 Hours]**

Memory Organization**:** Memory Hierarchy– Main Memory – Cache Memory – Virtual Memory.

Multiprocessors: **Characteristics of Multiprocessors * -** Interconnection Structures.

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

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion/Flipped Class//Peer learning/Experiential Learning/Blended Learning

Text Books:

1. Albert Malvino, Donald P.Leach (1995), **"Digital Principles and Applications"**, Third Edition, McGrawHill Company [Unit I, II, III].

2. M.MORRIS MANO (1999), "**Computer system Architecture "**, 3rd Edition, Pearson Education Publications, [Unit IV, V].

Reference Books:

1. T.C .Bartee (2003) , **" Digital computer Fundamentals "** , Sixth Edition, Tata McGraw Hill.

2. John P.Hayes (1998), **"Computer Architecture and Organization "**, Third Edition, Tata McGraw Hill Publishers Pvt Ltd.

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	H	M	S	H	H
CO4	S	S	S	S	M
CO5	S	S	S	H	S

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

UCS 29 **Sub Code: 24UCS505**

ProgrammeCode:**09**	**B.Sc ., Computer Science**			
Title of the Paper :	**Core Paper 5 – Artificial Intelligence**			
Batch **2024-2025**	Hours/Week **6**	Total Hours **90**	Credits **6**	Skill development & Employability

Course Objectives

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

Course Outcomes (CO)

K1 to K5	CO1	Remember the nature of AI problems and task domains of AI.
	CO2	Under stand the appropriate search procedures to solve the problems.
	CO3	Apply the suitable knowledge representation method.
	CO4	Analyze the acquired knowledge and infer new knowledge.
	CO5	Evaluate the AI techniques for encoding and accessing the knowledge in the development of AI systems.

Syllabus

UNIT I **[18 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 **[18 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 **[18 Hours]**

Knowledge Representation Issues: Representations and Mappings -Approaches to Knowledge Representations -Issues in Knowledge Representations - Frame Problem.

UNIT IV **[18 Hours]**

Using Predicate Logic: Representing Simple Facts in Logic - Representing Instance and Isa Relationships Computable Functions and Predicates - Resolution - Natural Deduction.

UCS 30 **Sub Code: 24UCS505**

UNIT V **[18 Hours]**

Representing Knowledge using Rules: Procedural Vs Declarative Knowledge – **Logic Programming – Forward Vs Backward Reasoning** * – Matching – Control Knowledge.

Expert Systems : Introduction – Characteristic Features of Expert System – Background History– Applications – Importance of Expert Systems.

Introduction to Neural Networks, Fuzzy Logic and Genetic Algorithms

* - 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. Elaine Rich and Kelvin Knight (1991), **" Artificial Intelligence"**, Tata McGraw Hill Publishers company Pvt Ltd, Second Edition, (chapters 1-6only).
2. Dan.W.Patterson, "**Introduction to Artificial Intelligence and Expert Systems**", Prentice Hall, India Learning Pvt Ltd, 2009.
3. S.Rajasekaran and G.A.Vijayalakshmi Pai, **"Neural Networks, Fuzzy Logic and Genetic Algorithms:Synthesis and Applications",** PHI Learning Pvt.Ltd , New Delhi,2011 (chapter-1 only)

Reference Books :

1. George F Luger (2002), **"Artificial Intelligence"**,4th Edition, Pearson Education Publ.
2. V.S.Janakiraman and K.Sarukesi (2001), "**Foundations of AI and Expert System**", Mac Milan India Ltd.

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	H	M	H	H
CO4	S	S	S	S	H
CO5	S	S	S	S	H

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

UCS 31 **Sub Code**: **24UCS506**

ProgrammeCode:**09**	**B.Sc., Computer Science**			
Title of the Paper :	**Core Paper 6 – Python Programming and IoT**			
Batch **2024-2025**	Hours/Week **5**	Total Hours **75**	Credits **5**	Skill development

Course Objectives

1. To understand the fundamentals of Python Programming and IoT
2. To get exposure to Programming Raspberry Pi with Python.
3. To acquire knowledge about IoT Enabling Technologies.

Course Outcomes (CO)

K1 to K5	CO1	Remember the concept of operators, data types, looping statements in python programming.
	CO2	Understand the concepts of Input / Output operations in file.
	CO3	Apply the various protocols for IoT.
	CO4	Analyze the applications of IoT in real time scenario.
	CO5	Evaluate the concept of Python's web Application

Syllabus

UNIT I **[16 Hours]**

Python: Introduction- **Data Types*** and Data Structures-Type Conversions-**Control Flow***-Functions-Modules-Packages-File Handling-Classes-Python Packages of Interest for IoT.

UNIT II **[15 Hours]**

Introduction to Internet of Things: Physical Design of IoT-Things in IoT-IoT Protocols-Logical Design of IoT-IoT Functional blocks-IoT Communication models- IoT Communication APIs-IoT Enabling Technologies, IoT Levels. Domain Specific IoTs: Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health & Life Style.

UNIT III **[14 Hours]**

IoT and M2M: M2M-Difference between IoT and M2M- SDN and NFV for IoT. IoT System Management with NETCONF- YANG: Need for IoT Systems Management- Simple Network Management Protocol (SNMP) - Network Operator Requirements, NETCONF, YANG, IoT Systems management with NETCONF-YANG.

UCS 32 **Sub Code: 24UCS506**

UNIT IV **[16 Hours]**

IoT Physical Devices & Endpoints: Basic Building Blocks of an IoT Device-Exemplary Device: Raspberry Pi- Raspberry Pi Interfaces-Programming Raspberry Pi with Python-Other IoT Devices.

UNIT V **[14 Hours]**

IoT Physical servers and cloud offerings: Introduction to cloud storage Models and communication APIs- WAMP Autobahn for IoT-Xively cloud for IoT-Python Web application Framework-Django-Designing a RESTful web API-Amazon web services for IoT-SkyNet IoT Messaging Platform.

* - Self Studyand questions for examinations may be taken from the self studyportions also.

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion/Flipped Class/Peer learning/Experiential Learning/Blended Learning

Text Book:

1. Arshdeep Bahga, Vijay Madisetti, (2016), "**Internet of Things A Hands on Approach**", Universities Press (India), Private Limited.

Reference Books:

1. E. Balagurusamy (2017), "**Problem Solving and Python Programming"**, McGraw-Hill, FirstEdition.
2. Gaston C.Hillar ,(2016), "**Internet of Things with Python"**, Packt Publishing.

MAPPING

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

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

UCS 33 **Sub Code**: **24UCS5CP**

ProgrammeCode:**09**	**B.Sc ., Computer Science**			
Title of the Paper :	**Core Practical 5 – Python Programming and IoT - Lab**			
Batch **2024-2025**	Hours/Week **6**	Total Hours **90**	Credits **2**	Employability

Course Objectives

1. To gain knowledge on the concepts of python programming.
2. To design IoT applications in different domain and be able to analyze their performance
3. To knowthe various hardware and sensing technologies to build IoT applications.

Course Outcomes (CO)

K3 to K5	CO1	Apply the basic concepts of python programming with IoT.
	CO2	Examine the IoT Enabling Technologies and Domain Specific IoTs.
	CO3	Analyze Programming in Arduino with Python
	CO4	Illustrate the Python Packages for IoT.
	CO5	Evaluate the ideas and concepts using Python with IoT.

LIST OF PRACTICAL PROBLEMS

1. Connect with the Available Wi-Fi Using Arduino
2. Sense the Available Networks Using Arduino
3. Write a program to measure the Distance Using Ultrasonic Sensor and Make LED Blink Using Arduino
4. Familiarize with Arduino and perform necessary software installation.
5. Write a program to turn on and off an LED connected to an Arduino board using Python.
6. Write a program to interface push button/ Digital sensor (IR) with Arduino and turn ON LED when push buttonis pressed or at a sensor detection.
7. Write a program to interface Bluetooth with Arduino and turn LED ON/OFF when ‘1’/’0’ is received from the smart phone using Bluetooth.
8. Write a program to measure the Soil Moisture using Arduino and Soil Moisture Sensor
9. Write a program to use DHT-11 sensor to measure the Temperature and Humidity using Arduino using Python.

UCS 34 **Sub Code: 24UCS5CP**

10. Write a program to measure the Distance using Ultrasonic sensor and Arduino
11 Detect the Vibration of an Object Using Arduino
12 Detect the object Using IR Sensor
13 Sense a Finger When it is Placed on Board Using Arduino
14 Write a program for Temperature Notification Using Arduino
15 Use LDR to Vary the Light Intensity of LED Using Arduino
16 Potentiometer and IR Sensor interfacing with Arduino
17 TDS Sensor Interfacing with Arduino
18 Actuators controlling by mobile using Arduino

Teaching Methods

SmartClassRoom/Powerpointpresentation/Seminar/Quiz/Discussion/FlippedClass//Peer learning/Experiential Learning/Blended Learning

Guidelines to the distribution of marks for Practical Examinations:

Two Questions will be given for each student. (3Hours/60 marks)

Record: **10 Marks**

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	**10**	**10**
Program Coding	**10**	**10**
Execution	**5**	**5**

MAPPING

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	H	S
CO2	H	S	S	S	H
CO3	S	H	S	H	H
CO4	S	M	S	S	H
CO5	S	S	S	H	S

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

UCS 35 **Sub Code**: **24UCS507**

ProgrammeCode:**09**	**B. Sc., Computer Science**			
Title of the Paper :	**Core Paper 7– Data Communication and Networking**			
Batch **2024-2025**	Hours/Week **6**	Total Hours **90**	Credits **5**	Skill development

Course Objectives

1. To know the OSI reference model and the TCP/IP reference model and protocols such as TCP,UDP and IP.
2. To familiarize the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.
3. To understand the concepts of transmission media, routing algorithms and collision control.

Course Outcomes (CO)

K1 to K5	CO1	Remember the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks.
	CO2	Understand the Internet structure and can see how standard problems are solved and the use of cryptography and network security
	CO3	Apply the knowledge of different techniques of error detection and correction to detect and solve error bit during data transmission.
	CO4	Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies
	CO5	Evaluate the different types of network devices and their functions within a network. Identify the different types of network topologies and protocols.

Syllabus

UNIT I **[18 Hours]**

Introduction to Data Communications and Networking: Introduction-Fundamental Concepts - Data Communication – Protocols – **Standards *** – Signal Propagation – Analog and Digital Signals. Information Encoding: Representing Different Symbols – Minimizing Errors - Analog and Digital Transmission Methods – Modes of Data Transmission and Multiplexing. Transmission Errors: Detection and Correction.

UNIT II **[18 Hours]**

Transmission Media: Guided Media - Unguided Media. Network Topologies: Mesh, Star, Tree, Ring, Bus – Switching: Circuit switching, Message switching, Packet switching. Routing Algorithms: Routers and Routing – Factors affecting Routing Algorithms – Routing Algorithms – Approaches to Routing – Network Protocols and OSI Model.

UNIT III **[18 Hours]**

Local Area Networks (LAN), Metropolitan Area Networks (MAN) and Wide Area Networks (WAN): LAN – Ethernet – MAN – Switched Multimegabit Data Services (SMDS) - WAN – WAN Architecture - WAN Transmission Mechanism - WAN Addressing – Packet Forwarding – Aloha - Integrated Services Digital Network (ISDN) – X.25 Protocol – Frame Relay.

UNIT IV **[18 Hours]**

Asynchronous Transfer Mode (ATM) - Internetworking Concepts, Devices, Internet Basics, History and Architecture – An Introduction to TCP / IP, IP, ARP, RARP, ICMP.

UNIT V **[18 Hours]**

TCP: Features of TCP**, Relationship between TCP and IP ***, Ports and Sockets, TCP connections, What makes TCP Reliable, TCP Packet Format – User Datagram Protocol (UDP): UDP Packet, Difference between UDP and TCP – Domain Name System (DNS) – Electronic Mail (Email) – File Transfer Protocol (FTP).

* - 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. Achyut S. Godbole, (2007), **Data Communications and Networks**, Ninth reprint, Tata McGraw-Hill Publishing Company Limited.

Reference Books:

1. Behrouz A. Forouzan, (2007), **Data Communications and Networking**, Second Edition Update, Nineteenth reprint, Tata McGraw-Hill Publishing Company Limited.
2. Andrew S. Tanenbaum, (2001), **Computer Networks**, Third Edition, Prentice Hall of India

MAPPING

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

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

UCS 37 **Sub Code: 24UCS608**

ProgrammeCode:**09**	**B .Sc., Computer Science**			
Title of the Paper :	**Core Paper 8 – Data Analytics**			
Batch **2024-2025**	Hours/Week **4**	Total Hours **60**	Credits **4**	Skill development & Employability

Course Objectives

1. To understand the fundamental concepts in data science.
2. To familiarize Data Classification, Sources of Data, Data Science user- roles and skills.
3. To acquire knowledge in Basics of R tool and statistical measures.

Course Outcomes (CO)

K1 to K5	CO1	Understand data classification, process of big data technology, user roles and skills in data science.
	CO2	Apply the fundamental concepts and techniques of data science in 360 view of Customer
	CO3	Analyze the methodologies of data science
	CO4	Implement the statistical measures using R
	CO5	Evaluate the data analysis techniques for applications handling large data.

Syllabus

UNIT I **[12 Hours]**

Data Evolution: Data Development Time Line – ICT Advancement-a Perspective – Data Growth-a Perspective – IT Components-Business Process – Landscape-Data to Data Science.

UNIT II **[12 Hours]**

Understanding data: Introduction – Type of Data: Numeric – Categorical – Graphical – High Dimensional Data — Data Classification – Hot Data – Cold Data – Warm Data – Thick Data – Thin Data - Classification of digital Data: Structured, Semi-Structured and Un-Structured. Sources of Data: Time Series – Transactional Data – Biological Data – Spatial Data – Social Network Data – Data Evolution – **Data Sources***

UNIT III **[12 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. Data Science. Components: Data Engineering, Data Analytics-Methods and Algorithm, Data Visualization

UCS 38 **Sub Code: 24UCS608**

UNIT IV **[12 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 0 Importing and Exporting files.

Data Visualization in R : Introduction – Exploratory data analytics – Lattice package – Datasets – Histogram – Densityplot – Box plot – Bar chart – Strip plot – Theoretical Quintile plot – **Dot plot***– Scatter plot.

UNIT V **[12 Hours]**

Statistical Measures – Introduction – Understanding data distribution – Usecase: Central tendency measure – Measure of variability – Range – Inter Quartile Range – Variability Analysis using Mean – Median Absolute deviation – Data Standardizing – **Sampling Distribution** – **Probability distribution** * – Hypothesis Tests.

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

Books for Study

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion/Flipped Class//Peer learning/Experiential Learning/Blended Learning

Text Books:

1. V. Bhuvaneswari, T. Devi (2016) **"Big Data Analytics: A Practitioner'sApproach".**
2. V. Bhuvaneswari (2018), **" Data Analytics with R Programming"**, Scitech Publications.

Reference Books:

1. Nina Zumal, John Mount (2014). Practical Data science in R, Managing Publication Company.
2. Bernard Kolman, Robert C. Busby and Sharon Ross (2004). Discrete Mathematical Structures, New Delhi: Prentice Hall.

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	H	M	S	H	H
CO4	S	S	S	S	M
CO5	S	S	S	S	H

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

UCS 39 **Sub Code**: **24UCS609**

ProgrammeCode:**09**	**B. Sc ., Computer Science**			
Title of the Paper :	**Core Paper 9 – PHP Programming**			
Batch **2024-2025**	Hours/Week **4**	Total Hours **60**	Credits **5**	Skill development & Entrepreneurship

Course Objectives

1. To understand the basic programming techniques using PHP.
2. To gain an insight of creating classes and using functions in PHP.
3. To know the process of developing a PHP application and to work with files and directories.

Course Outcomes (CO)

K1 to K5	CO1	Remember the basic syntax of PHP
	CO2	Understand Arrays and Strings in PHP
	CO3	Apply the concepts of files and directories
	CO4	Analyze the database connectivity using PHP and SQL
	CO5	Evaluate the effectiveness of PHP programming concepts in developed applications.

Syllabus

UNIT - I **[11 Hours]**

Introduction to 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 **[13 Hours]**

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

UNIT-III **[12 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***.

UCS 40 **Sub Code: 24UCS609**

UNIT-IV **[12 Hours]**

Using functions and classes: Creating user defined functions –Creating classes - Working with Files and Directories: Reading Files – Writing Files – Processing Directories.

UNIT-V **[12 Hours]**

Working with Databases and SQL: Creating and populating a Database with MySQL and MySLi —Working with Cookies, Sessions – IOS and Android services.

* - 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. Vikram Vaswani, (2008), **PHP – A Beginner's Guide**, First Edition, Tata McGraw–Hill publications.
2. J.F. DiMarzio, (2008), **Android: A Programming Guide**, McGraw Hill Education India
3. Matt Neuburg, (2016), **iOS 10 Programming Fundamentals with Swift** , O'Reilly Media Pub

Reference Books:

1. Steven Holzner, (2007), **The PHP Complete Reference**, First Edition, Tata McGraw–Hill publications.
2. Steven Holzner , (2005), **Spring in to PHP5**, Addison Wesley Publications.

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	H	M	S	H	H
CO4	S	S	S	S	M
CO5	S	S	S	S	H

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

UCS 41 **Sub Code**: **24UCS6CQ**

ProgrammeCode:**09**	**B. Sc ., Computer Science**			
Title of the Paper :	**Core Practical 6 – PHP Programming Lab**			
Batch	Hours/Week	Total Hours	Credits	Employability
2024-2025	**6**	**90**	**2**	

Course Objectives

1. To develop the ability to build efficient web based applications using PHP
2. To learn the basic constructs in PHP Programming.
3. To utilize the concepts of Strings and Array functions in PHP applications.

Course Outcomes (CO)

K3 to K5	CO1	Apply the concepts of PHP programming fundamental features
	CO2	Examine string functions and arrays to develop the applications.
	CO3	Analyze file system functions.
	CO4	Illustrate SESSION and COOKIE concepts in PHP applications.
	CO5	Evaluate the web pages implemented containing PHP and MySQL.

List of Practical Programs

1. Develop a PHP program using controls and functions.
2. Design a simple web page to generate multiplication table for a given number.
3. Develop a PHP program and Check message passing mechanism between pages.
4. Develop a PHP program using String functions and Arrays.
5. Design a web page to compute age for a given date.
6. Develop a PHP program using parsing functions (useTokenizing)
7. Develop a PHP program to find the GCD of two numbers using user defined functions.
8. Develop a PHP program to check File System Functions.
9. Write a program to download a file from the server.
10. Write a program to generate mark statement of a student.
11. Develop a PHP program for mail IDcreation.
12. Develop a PHP program to design a college application form using MYSQL table.
13. Design an authentication web page in PHP with MySQL to check username and password.
14. Write a program to store page views count in a SESSION, to increment the count on each refresh and to show the count on web page.
15. Write a PHP program to store current date-time in a COOKIE and display the 'Last visited on' Date- Time on the web page upon reopening of the same page.
16. Create a simple HTML form with fields for name and email. Write a PHP script to handle form submission and display the entered data.
17. Write a php program to check whether given number is Armstrong or not.
18. Write a php program to find largest values of two numbers using nesting of function.

UCS 42 **Sub Code: 24UCS6CQ**

Teaching Methods

SmartClassRoom/Powerpointpresentation/Seminar/Quiz/Discussion/FlippedClass//Peer learning/Experiential Learning/Blended Learning

Guidelines to the distribution of marks for Practical Examinations:

Two Questions will be given for each student. (3Hours/**60** marks)

Record: **10 Marks**

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	**10**	**10**
Program Coding	**10**	**10**
Execution	**5**	**5**

MAPPING

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	H	S	M
CO2	H	S	S	S	S
CO3	S	H	H	S	S
CO4	S	S	H	S	S
CO5	S	S	S	H	S

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

UCS 43 **Sub Code: 24UCS610**

ProgrammeCode:**09**	**B. Sc., Computer Science**			
Title of the Paper:	**Core Paper 10 – Information Security**			
Batch **2024-2025**	Hours/Week **5**	Total Hours **75**	Credits **5**	Employability

Course Objectives

1. To understand the basics of computer security and cyber-crimes.
2. To familiarize the role of security in operations system and databases.
3. To know various types of viruses, attacks and threats in hardware, software and data security.

Course Outcomes (CO)

K1 to K5	CO1	Remember the basics of computer security and its terminology.
	CO2	Understand the various Attacks, Threats and Vulnerabilities in the system.
	CO3	Apply cyber security risk management policies in order to adequately protect critical information and assets.
	CO4	Analyze the needs of the Information security of data.
	CO5	Evaluate the appropriate security technologies and policies to protect computers and digital information.

Syllabus

UNIT I **[14 Hours]**

Is there Security Problem in Computing? : What does Security mean? –Attacks-The Meaning of Computer Security-Computer Criminals. Protection in general purpose operating systems: Protected Objects and Methods of Protection-Memory and Address Protection-Control of Access to General Objects-File Protection Mechanisms-User Authentication.

UNIT II **[16 Hours]**

Program Security: Secure Programs- Non malicious Program Errors – Viruses and other Malicious Code - Targeted Malicious Code - Controls against Program Threats.

UNIT III **[15 Hours]**

Database and Data Mining Security: Introduction to Databases- Security Requirements-Reliability and Integrity - **Multilevel Databases*** – Proposals for Multilevel Security- Data Mining.

UNIT IV **[14 Hours]**

Security in Networks: **Network Concepts***-Threats in Networks-Firewalls-Intrusion Detection Systems. Web Security: Web Application (In) Security – Mobile Security: Rethinking Mobile Security

UCS 44 **Sub Code: 24UCS610**

UNIT V **[16 Hours]**

Legal and Ethical Issues in Computer Security: Protecting Programs and Data- Information and the Law-Computer Crime- Ethical Issues in Computer Security.

Teaching Methods

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

Text Books:

1. Charles P Pfleeger and Shai Lawrence Pfleeger, (2007), "**Security in Computing",** Fourth Edition, Prentice Hall.
2. Dafydd Stuttard and Marcus Pinto, (2011), **"The Web Application Hacker's Handbook: Finding and Exploting Security Flaws"** , 2nd Edition, Wiley.
3. Lawrence C. Miller, CIISP , **" Mobile Security for Dummies",** Palo Alto Networks Edition.

Reference Books:

1. Ross J.Anderson and Ross Anderson (2001), **"Security Engineering: A Guide to Building Dependable Distributed Systems"**, Wiley.
2. Debby Russell and Sr.G.T.Gangemi (2006),"**Computer Security Basics (Paperback)"**, Second Edition, O'Reilly Media.
3. Thomas R.Peltier, Justin Peltier and John Blackley (2001), **"Information Security Fundamentals"**, 2ndEdition, Prentice Hall, Reprint.

MAPPING

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

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

UCS 45 **Sub Code: 24UCS6Z1**

ProgrammeCode:**09**	**B. Sc., Computer Science**			
Title of the Paper :	**Project Work and Viva-Voce**			
Batch **2024-2025**	Hours/Week **4**	Total Hours **60**	Credits **5**	Employability

Course Objectives

1. To understand and select the task based core skills.
2. To get knowledge about analytical skill for solving the selected task.
3. To get confidence for implementing the task and solving the real time problems.

Course Outcomes (CO)

K3 to K5	CO1	Apply the domain specific knowledge and define the project.
	CO2	Analyze the achievable goals and choose the right software for project development
	CO3	Estimate the resources and create the project schedule
	CO4	Test the deliverables
	CO5	Evaluate the project results.

MARK DISTRIBUTION:

Particulars	**Marks**
Project Report*	**60**
Viva–Voce*	**20**

*Both Internal &External Examiners shall evaluate Project &Viva-Voce jointly.

MAPPING

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	H	H	H
CO2	M	H	H	H	H
CO3	H	H	H	M	M
CO4	S	S	H	M	M
CO5	S	S	H	H	S

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

UCS 46 **Sub Code: 24UCS6Z1**

ProgrammeCode:**09**	**B .Sc .,Computer Science.**			
Batch:**2024-2025**	**Elective Paper–Cloud Computing**			
	Hours/Week **5**	Total Hours **75**	Credits **5**	Skill development

Course Objective

1. To understand the basics of cloud computing and its architecture.
2. To acquire the knowledge on accessingthe cloud and cloudstorage.
3. To familiarize the concepts of cloud applications, cloud services and cloud security.

Course Outcomes (CO)

K1 to K5	CO1	Remember the concepts of cloud Architecture and its services.
	CO2	Understand the different services providers and its services, tools.
	CO3	Apply the various web based applications for collaborating everyone in the cloud computing.
	CO4	Analyze the best service provider for cloud computing in terms of storage, services.
	CO5	Evaluate the appropriate cloud computing solutions and recommendations according to application use

Syllabus

UNIT-I **[14 Hours]**

Cloud Computing Basics: Cloud Computing Overview – Applications – Intranets and the Cloud. Hardware and Infrastructure: Clients– Security – Network - Services.

UNIT-II **[15 Hours]**

Cloud Computing Architecture: Introduction - Cloud Reference Model – Types of Clouds – Organizational aspects.

UNIT – III **[16 Hours]**

Accessing the Cloud: Platforms – Web Applications – Web Browsers. Cloud Storage: Overview –Cloud Storage Providers.

UCS 47 **Sub Code: 24UCS6Z1**

UNIT – IV **[15 Hours]**

Cloud Applications: Scientific Applications: Healthcare, Geosciences – Business and Consumer Applications: CRM and ERP, **Media Applications***, **Multiplayer Online Gaming*.**

UNIT – V **[15 Hours]**

Standards: Application – Client – Infrastructure – Service. Software as a Service: Overview – Driving Forces - Industries – Healthcare, Banking.

* - 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. Anthony T.Velte ,Toby J.Velte, Robert Elsenpeter (2010), **"Cloud Computing – A Practical Approach"** , TMH (UNIT I, UNIT III, UNIT V).
2. Rajkumar Buyya, Christian vecchiola , Thamarai selvi (2013), **"Mastering Cloud computing",** Mc Gram Hill Edu, (UNIT II, UNIT IV).

Reference Books:

1. Haley Beard (July 2008), **"Cloud Computing Best Practices for measuring processes for on demand computing, Applications and data centers in the cloud with SLA's "** .
2. Judith Hurwitz, Robin Bloon (2009),**" Cloud Computing for Dummies"**.
3. Michael Miller (2009), **" Cloud computing – Web based application "** , Pearson Edu Inc, First Impression.

MAPPING

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

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

UCS 48

ProgrammeCode:**09**	**B.Sc ., Computer Science**			
Elective Paper – Software Engineering and Testing				
Batch **2024-2025**	Hours/Week **5**	Total Hours **75**	Credits **5**	Skill development & Employability

Course Objectives

1. To understand the basic software engineering methods and practices.
2. To familiarize the techniques for developing software systems.
3. To enrich the knowledge about object oriented design and software testing approaches.

Course Outcomes (CO)

K1 to K5	CO1	Remember the basic concepts of software engineering
	CO2	Understand the software engineering models in developing software applications.
	CO3	Apply the object oriented design in various projects
	CO4	Analyze the various software testing approaches
	CO5	Evaluate the Software testing Plan and Reporting

Syllabus

UNIT I **[15 Hours]**

Introduction – The Evolving Role of Software – Software Crisis – Software Myths – Software Engineering Technology – Software Process Models – Prototyping Model- Requirements Engineering – System Modeling.

UNIT II **[15 Hours]**

Requirements Analysis and Elicitation for Software – Software Prototyping – Specification – Mechanics of Structured Analysis – Data Dictionary –Elements of Analysis Model- Functional Modeling and Information Flow - Transform Mapping – Transaction Mapping.

UNIT III **[15 Hours]**

Object Oriented Design – Design for Object-Oriented Systems - System Design Process. Introduction: Quality, Quality Assurance and Quality Control - Testing, Verification and Validation. Types of Testing: White-Box Testing- Black-Box Testing.

UNIT IV **[15 Hours]**

Integration Testing: What is Integration Testing-Integration Testing as a Type of Testing-Integration Testing as a Phase Testing - Scenario testing - System and Acceptance Testing: Functional versus Non-functional Testing - Functional Testing – Nonfunctional Testing – Acceptance Testing.

UCS 49

UNIT V **[15 Hours]**

Performance Testing: Introduction - Factors Governing Performance Testing-Methodology for Performance Testing- Regression Testing: What is Regression Testing- Types of Regression Testing - **Test Planning*, Execution and Reporting***.

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

Teaching Methods

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

Text Books:

1. Roger S Pressman (2001), **"Software Engineering"**, 5th Edition, TMH Publishers [Unit I,II&III].
2. Srinivasan Desikan & Gopalswamy Ramesh (2006),"**Software Testing Principles and Practices"**, Pearson Education. [Unit IV & V]

Reference Books:

1. Ian Somerville (2001), **"Software Engineering",** 6th Edition, Pearson Education Publication.
2. William E.Perry(2006), **"Effective Methods for Software Testing"**, 3rd Edition, Wiley, India.

MAPPING

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

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

UCS 50

ProgrammeCode:**09**	**B.Sc ., Computer Science**			
Batch:**2024-2025**	**Elective Paper–Embedded Systems**			
	Hours/Week **5**	Total Hours **75**	Credits **5**	Employability

Course Objectives

1. To familiarize all aspects of design and development of an embedded System.
2. To understand hardware and software requirements for developing a system.
3. To know the basic concepts of operating systems and embedded system project management.

Course Outcomes (CO)

K1 to K5	CO1	Remember the basics about microcontrollers, embedded processors and their applications.
	CO2	Understand the internal architecture and interfacing of different peripheral devices with Microcontrollers.
	CO3	Applykey conceptsofembedded systems likeinterruptsinteraction,drivers,and portswith peripheral devices.
	CO4	Analyze the design concept of embedded systems.
	CO5	Evaluate the requirements of programming Embedded Systems, related software architectures and tool chain for Embedded Systems.

Syllabus

Unit I **[15 Hours]**

Introduction to Embedded System: An Embedded System – Processor in the System– Other Hardware units – Software embedded into a system – Exemplary embedded system – Embedded system on chip and in VLSI circuit. Processor and Memory organization: Structural units in a processor – Processor selection – **Memory devices**,**Memory selection** *- Allocation of memory – DMA.

Unit II **[14 Hours]**

Devices and buses for device networks: I/O devices – Device drivers and Interrupts servicing mechanism: Device drivers – Parallel port device drivers – Serial port device drivers– Interrupt servicing mechanism – Context and the periods for context-switching, dead-line and interrupt latency.

Unit III **[16 Hours]**

Program modeling concepts in single and multiprocessor systems: Modeling process for software analysis before software implementation – Programming models for event controlled or response time constrained real time programs. Inter-process communication and synchronization of processes, tasks and threads: Multiple processor – Problem of sharing data by multiple tasks and routines – Inter-process communication.

Unit IV **[15 Hours]**

Real time operating systems: Operating system services – I/O subsystem – Network operating systems – Real time and embedded operating systems – Interrupt routine in RTOS environment – RTOS task scheduling.

UCS 51

Unit V **[15 Hours]**

Embedded system project management – embedded system design and code design issues in system development process – Uses of target system or its emulator and In circuit emulator – Uses of scopes and logic analysers for system h/w tests – **Issues in embedded system design***.

* - 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. RajKamal,(2007), **Embedded Systems – Architecture, Programming And Design**, Second Edition, TMH publications.

Reference Books:

1. David E Simon, (1999), **An Embedded Software Primer,** Thirteenth Reprint, Addison Wesley, Pearson Education Asia.
2. Tammy Noergaard, (2013), **Embedded System Architecture**, Second Edition, Elsevier.

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	H	M	H	H
CO4	S	S	S	S	H
CO5	S	H	S	S	S

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

UCS 52

ProgrammeCode:**09**	**B.Sc., Computer Science**			
Batch:**2024-2025**	**Elective Paper–Systems Software and Operating Systems**			
	Hours/Week **5**	Total Hours **75**	Credits **5**	Skill development & Entrepreneurship

Course Objective

1. To understand the design and implementation of language processors, compilers and Linkers.
2. To attain an in-depth understanding of Process Concepts, Memory Management, Job Scheduling
3. To get exposure to seek optimization techniques and File Systems

Course Outcomes (CO)

K1 to K5	CO1	Remember the program generation and program execution activities.
	CO2	Understand the functioning of Assembler, Compiler and Linker
	CO3	Apply various process concepts
	CO4	Analyze job scheduling algorithms
	CO5	Evaluate various storage management strategies

Syllabus

UNIT I **[14 Hours]**

Language Processors and Assemblers : Introduction – Language Processing activities – Fundamentals of language processing. Elements of assembly language programming – A simple assembly scheme – Pass structure of assemblers

UNIT II **[15 Hours]**

Compilers and Linkers : Aspects of compilation – Compilation of Expressions – A toy code generator forexpressions – Intermediate code for expressions – compilation of control structures – Code optimization – Optimizing transformations.Linkers : Execution of a program in language L - relocation and linking concepts.

UNIT III **[16 Hours]**

What is an Operating System? – Process Concepts: Definition of Process - Process States – Process StatesTransition – Interrupt Processing – Interrupt Classes - Storage Management: Real Storage: Real Storage Management Strategies – Contiguous versus Non-contiguous storage allocation – Single User Contiguous Storage allocation- Fixed partition multiprogramming – Variable partition multiprogramming.

UCS 53

UNIT IV **[15 Hours]**

Virtual Storage: Virtual Storage Management Strategies – Page Replacement Strategies – Working Sets – DemandPaging – Page Size. Processor Management: Job and Processor Scheduling: Preemptive Vs Non-preemptive scheduling – Priorities – Deadline scheduling.

UNIT V **[15 Hours]**

Device and Information Management Disk Performance Optimization: Operation of moving head disk storage – Need for disk scheduling – Seek Optimization – File and Database Systems: File System – Functions – Organization – Allocating and freeing space – File descriptor – Access control matrix.

* - 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. D.M. Dhamdere (2002), "**Systems Programming And Operating Systems**" Tata McGraw-HillPublishing Company Limited -Second Revised Edition .
2. H.M. Deitel, Operating Systems, 2nd Edition, Perason, 2003.

Reference Books:

1. Leland.L.Beck (1997), "**An Introduction to System Programming**", Addison Wesley, Third Edition.
2. J Achyut S. Godbole, Operating Systems, TMH, 2002.

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	S	H	M	H
CO4	S	S	S	S	H
CO5	S	S	H	S	S

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

UCS 54

ProgrammeCode:**09**	**B.Sc ., Computer Science**			
Batch:**2024-2025**	**Elective Paper–Mobile Computing**			
	Hours/Week **5**	Total Hours **75**	Credits **5**	Employability

Course Objectives

1. To know the basic concepts of Mobile Computing and its Applications.
2. To familiarize the various emerging technologies in Mobile computing services.
3. To gain knowledge about GSM, GPRS, CDMA and3G.

Course Outcomes (CO)

K1 to K5	CO1	Remember the concept of Wireless LANs, PAN, Mobile Networks
	CO2	Understand positioning techniques of location-based services and applications
	CO3	Apply all techniques used in the GSM and GPRS
	CO4	Analyze CDMA and wireless LANS.
	CO5	Evaluate the infrastructures and technologies of mobile computing.

Syllabus

UNIT I **[15 Hours]**

Introduction: Mobility of bits and bytes, wireless- The beginning, mobile computing – Networks – Middleware and Gateways – Application and Services – Developing Mobile computing Applications – Security in Mobile Computing.

Mobile Computing Architecture: History of Computers – History of Internet – Internet – The ubiquitous network – Architecture for Mobile Computing– Three Tire Architecture - Design consideration for Mobile Computing- Mobile Computing through Internet – Making existing Applications Mobile - Enabled.

UNIT II **[15 Hours]**

Mobile Computing through Telephony: Evolution of Telephony – Multiple Access Procedures - Mobile Computing through Telephone – Developing an IVR application – Voice XML – Telephony Application Programming Interface (TAPI)

Emerging Technologies: Introduction – Bluetooth- Radio Frequency Identification – Wireless broadband – Mobile IP- Internet Protocol Version 6(IPV6)- Java Card.

UNIT III **[15 Hours]**

Global system for Mobile Communication (GSM): Global system for Mobile Communication- GSM Architecture – GSM entities – Call routing in GSM, PLMN Interface – GSM Address Identifiers – Network aspects in GSM- GSM frequency allocation – Authentication and Security.

Short Message Service (SMS) : Mobile Computing over SMS - **Short Message Service***- Value added services through SMS – Accessing the SMS bearer.

UCS 55

UNIT IV **[15 Hours]**

General Packet Radio Service (GPRS) : Introduction – GPRS and packet data network – GPRS network architecture – GPRS network operations – Data services in GPRS – Applications for GPRS- limitations of GPRS – Billing and Charging in GPRS.

Wireless Application Protocol (WAP): Introduction – WAP – MMS- GPRS application.

UNIT V **[15 Hours]**

CDMA and 3G : Introduction – Spread spectrum technology – IS 95- CDMA versus GSM – Wireless data – Third generation network – Application on 3G.

Wireless LAN : Introduction – Wireless LAN advantages – IEEE 802.11 standards – Wireless LAN architectures – Mobility in Wireless LAN – Deploying Wireless LAN – Mobile Ad-hoc network and sensor network – Wireless LAN Security – WiFi versus 3G.

*** Self Study and questions forexaminations 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. Ashok K Talukder, Roopa R Yavagal, "Mobile Computing ", Tata McGraw Hill Publishing Company Ltd, 2005.

Reference Books:

1. Jochen Schiller, (2004), **Mobile Communications**, Second Edition, AddisionWesely Publications.
2. UWE Hansmann, LotherMerk, Martin.S, (2006), **Principles of Mobile Computing,** Second Edition, Springer publications.
3. Jeyasri Arokiamary,(2005), **Mobile Communications**, First Edition, Anuradha Agencies.

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	S	H	M	H
CO4	S	S	S	S	H
CO5	S	S	H	S	S

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

UCS 56

ProgrammeCode:**09**	**B.Sc ., Computer Science**			
Batch:**2024-2025**	**Elective Paper–Machine Learning**			
	Hours/Week **5**	Total Hours **75**	Credits **5**	Skill Development & Employability

Course Objectives

1. To know the basic concepts of machine learning.
2. To applythe appropriate machine learning strategy for any given problem
3. To distinguish between, supervised, unsupervised and semi-supervised learning

Course Outcomes (CO)

K1 to K5	CO1	Remember the basic concepts and techniques of Machine Learning.
	CO2	Understand supervised, unsupervised or semi-supervised learning algorithms
	CO3	Apply the appropriate machine learning strategy for any given problem
	CO4	Analyze the uses of appropriate graph models of machine learning
	CO5	Evaluate the existing machine learning algorithms to improve its efficiency

Syllabus

UNIT I **[16 Hours]**

Learning – Types of Machine Learning – Supervised Learning – The Brain and the Neuron – Design a Learning System – Perspectives and Issues in Machine Learning – Concept Learning Task – Concept Learning as Search – Finding a Maximally Specific Hypothesis – Version Spaces and the Candidate Elimination Algorithm – Linear Discriminants – Perceptron – Linear Separability – Linear Regression.

UNIT II **[15 Hours]**

Multi-layer Perceptron – Going Forwards – Going Backwards: Back Propagation Error – Multi-layer Perceptron in Practice – Examples of using the MLP – Overview – Deriving Back-Propagation – Radial Basis Functions and Splines – Concepts – RBF Network – Curse of Dimensionality – Interpolations and Basis Functions – Support Vector Machines

UNIT III **[14 Hours]**

Learning with Trees – Decision Trees – Constructing Decision Trees – Classification and Regression Trees – Ensemble Learning – Boosting – Bagging – Different ways to Combine Classifiers – Probability andLearning – Data into Probabilities – Basic Statistics – Gaussian Mixture Models – Nearest Neighbor Methods – Unsupervised Learning – K means Algorithms – Vector Quantization – Self Organizing Feature Map

UCS 57

UNIT IV **[15 Hours]**

Dimensionality Reduction – Linear Discriminant Analysis – Principal Component Analysis – Factor Analysis – Independent Component Analysis – Locally Linear Embedding – Isomap – Least Squares Optimization – Evolutionary Learning – Genetic algorithms – Genetic Offspring: - Genetic Operators – Using Genetic Algorithms – Reinforcement Learning – Overview – Getting Lost Example – MarkovDecision Process

UNIT V **[15 Hours]**

Markov Chain Monte Carlo Methods – Sampling – Proposal Distribution – Markov Chain Monte Carlo – Graphical Models – Bayesian Networks – Markov Random Fields – Hidden Markov Models – Tracking Methods

*** Self Study and questions forexaminations 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. Stephen Marsland, ―Machine Learning – An Algorithmic Perspective‖, Second Edition, Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014.
2. Tom M Mitchell, ―Machine Learning‖, First Edition, McGraw Hill Education, 2013.

Reference Books

2. Peter Flach, ―Machine Learning: The Art and Science of Algorithms that Make Sense of Data‖, First Edition, Cambridge University Press, 2012.
3. Jason Bell, ―Machine learning – Hands on for Developers and Technical Professionals‖, First Edition, Wiley, 2014

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	S	H	M	H
CO4	S	S	S	S	H
CO5	S	S	H	S	S

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

UCS 58

Sub Code: 24UGC3S1

ProgrammeCode:	**For B.A., BBA CA, B.Com, BCA and B.Sc ., Degree Students**			
SKILL BASED SUBJECT 1 : CYBER SECURITY				
Batch **2024-2025**	Hours/Week **2**	Total Hours **30**	Credits **3**	Skill Development & Employability

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)

K1	CO1	To Understand the Concepts of Cybercrime and Cyber Frauds
K2	CO2	To Know about Cyber Terrorism and its preventive measures
K3	CO3	To Analyze about the Internet, Mobile Phone and E-commerce security issues
K4	CO4	To Understand about E-mail and Social Media Issues
K5	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 CyberSecurity- 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 internethours - Internet safety tips for children & parents. Mobile phone privacy- E-Commerce security issues.

Unit IV **[6 Hours]**

Email and Social media issues: Aspects of Social Media- The Vicious Cycle of unhealthy social media use- Modifyingsocial 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.

UCS 59 **Sub Code: 24UGC3S1**

Teaching Methods:

Chalk and Talk, Presentation, Seminar, Quiz, Discussion & Assignment

Text Book:

1. **"Cyber Security", Text Book** prepared by "Kongunadu Arts and Science College",Coimbatore -29, 2023.

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,1stEdition 2010.
4. Shilpa Bhatnagar,**"Encyclopaedia of Cyber and Computer Hacking**",Anmol Publications,1st Edition 2009.

Web References:

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

Mapping

PSO / CO	PSO1	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

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

UCS 60

Question Paper Pattern

(Internal Only)

Duration: 3hrs **Max: 75Marks**

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	**5**
6.	Any Case Study Related to Cyber Security	**15**
	Total	**100**

Sub Code: 24UCS4SL

UCS 61

ProgrammeCode:**09**	**B.Sc ., Computer Science**			
Title of the Paper : Skill Based Subject 2 – Mobile Application Development Lab				
Batch **2024-2025**	Hours/Week **2**	Total Hours **30**	Credits **3**	Skill Development & Employability

Course Objectives

1. To understand the Android application development environment
2. To know the user interfaces for interacting with apps and triggering actions
3. To realize the tasks used in handling multiple activities

Course Outcomes (CO)

K3 to K5	CO1	Apply the skills for designing and implementing basic mobile apps
	CO2	Examine the basic programming skills needed for developing mobile apps for a specific platform.
	CO3	Analyze the options to save persistent application data
	CO4	Illustrate the role of security and performance in Android applications
	CO5	Evaluate the functionality of mobile application using android sdk

List of Practical Programs

1. Develop an application that uses GUI components, Font and Colors.
2. Develop an application that uses Layout Managers and Event listeners.
3. Develop a native calculator application using UI Widgets.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an application that uses Multiple Fonts and Colors using UI Widgets.
6. Develop a native application that uses GPS location information.
7. Implement an application that writes data to the SD card using UI Widgets.
8. Implement an application that creates an alert upon receiving a message.
9. Write a mobile application that creates alarm clock using UIWidgets.
10. Develop a mobile application to send an email.

UCS 62

SubCode: 24UCS4SL

Teaching Methods

SmartClassRoom/Powerpointpresentation/Seminar/Quiz/Discussion/FlippedClass//Peer learning/Experiential Learning/Blended Learning

Guidelines to the distribution of marks for Practical Examinations:

Two Questions will be given for each student. (3Hours/**60** marks)

Record: **10 Marks**

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	**10**	**10**
Program Coding	**10**	**10**
Execution	**5**	**5**

MAPPING

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	H	S	M
CO2	H	S	S	S	S
CO3	S	H	H	S	S
CO4	S	S	S	H	S
CO5	S	S	H	S	S

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

UCS 63

Sub Code:**24UBI6S3**

Programme Code :	For B.A., BBA, B.Com, BCA and B.Sc., Degree Students		
Skill Based Subject III - BASICS OF INTELLECTUAL PROPERTY RIGHT'S			
Batch	**Hours / Week**	**Total Hours**	**Credits**
2024-2025	**2**	**30**	**2**

COURSE OBJECTIVES

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

COURSE OUTCOMES

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

K1 ↕ 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 protection 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.

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.

UCS 64

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.

Teaching Methods

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

TEXT BOOKS

1. Ramakrishna Chintakunta and M. Geethavani (2022). A Textbook of Intellectual Property
2. 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.

3. Barrett and Margreth (2009). Intellectual Property. New York Aspen publishers.

4. Deborah E.Bouchoux(2013). Intellectual property:The Law of Trademarks, Copyrights, Patents, and Trade Secrets. Publisher: Cengage India

REFERENCES

1. B.Ramakrishna and H.S.Anil Kumar (2017). Fundamentals of Intellectual Property Rights:
2. For Students, Industrialist and Patent Lawyers.Notion Press.

2. V. K. Ahuja(2013). Law relating to Intellectual Property rights (2nd Edn). LexisNexis.

2. 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.

UCS 65

Sub Code:**24UCS5XL**

ProgrammeCode:**09**	**B. Sc ., Computer Science**			
Title of the Paper :	**EDC– Web Designing using HTML**			
Batch **2024-2025**	Hours/Week **2**	Total Hours **30**	Credits **3**	Employability

Course Objectives

1. To know the basic concepts of the World Wide Web, principles and tools used to develop Webapplications.
2. To develop an ability to design and implement static and dynamicwebsite.
3. To design and develop a Web site using text, images, links, lists, and tables for navigation and layout.

Course Outcomes (CO)

K3 to K5	CO1	Apply the internet related concepts that are vital in understanding web site development.
	CO2	Examine the important HTML tags for designing web pages.
	CO3	Analyze the interactive web applications through coding using HTML.
	CO4	Illustrate the creation of static webpage using HTML.
	CO5	Evaluate the results on creativity and innovation of web pages developed using HTML tags.

LIST OF PRACTICAL PROBLEMS

1. Design a web page for a company using HTML formatting tags.
2. Design a web page that illustrate ordered and unordered list.
3. Design a web page with the following components
   a. Image b. Hyperlink
4. Design a web page for Library system using HTML tags.
5. Design a web page for your college using HTML tags.
6. Create a class Time table using Table tag
7. Design a web page which shows your resume using HTML tags.
8. Design a web page to advertise a product using HTML tags.
9. Design a web page to create Student Mark sheet Entry Form.
10. Create a web service for Currency conversion with the client program.

UCS 66

Teaching Methods

SmartClassRoom/Powerpointpresentation/Seminar/Quiz/Discussion/FlippedClass//Peer learning/Experiential Learning/Blended Learning

Guidelines to the distribution of marks for Practical Examinations:

Two Questions will be given for each student.

(3Hours/**60** marks)Record: **10 Marks**

Particulars	**Program1 (Marks)**	**Program2 (Marks)**
Algorithm	**10**	**10**
Program Coding	**10**	**10**
Execution	**5**	**5**

MAPPING

PSO / CO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	S	S	H	S	M
CO2	H	S	S	S	S
CO3	S	H	H	S	S
CO4	S	S	S	M	S
CO5	S	S	H	S	S

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

UCS 67

Sub Code: 24EVS101

For B.A., BBA, B.Com, BCA and B.Sc., Degree Students				
PART IV – ENVIRONMENTAL STUDIES				
Batch 2024-2025	**Semester I**	**Hours / Week 2**	**Total Hours 30**	**Credits 2**

COURSE OBJECTIVES

- 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
- To inculcate knowledge and create awareness about ecological and environmental concepts, issues and solutions to environmental problems.
- To shape students into good "Ecocitizens" thereby catering to global environmental needs.
- 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
- 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

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

K1 ↑	CO 1	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
↓ K5	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

UNIT I

Multidisciplinary Nature Of Environment

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.

UCS 68 **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 **[6hours]**

Biodiversity and its Conservation

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 **[6 hours]**

Environmental Pollution

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 **[6 hours]**

Social Issues and the Environment

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.

UCS 69

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion/Flipped Class//Peer learning/Experiential Learning/Blended Learning

Text Book

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

Reference Books

1. PurohitShammi Agarwal, **"A Text Book of Environmental Sciences"**, Publisher Mrs. SaraswatiProhit,Student Edition, 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 ofIndia Private Ltd., New Delhi – 110 001.

Question Paper Pattern

(External Only)

Duration: 3 hours Total Marks: 50

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

UCS 70 **Sub Code : 24VED201**

For B.A., BBA, B.Com, BCA and B.Sc., Degree Students				
PART IV – VALUE EDUCATION – MORAL AND ETHICS				
Batch **2024-2025**	**Semester** **I**	**Hours / Week** **2**	**Total Hours** **30**	**Credits** **2**

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)

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

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 analyze 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.

UCS 71

Sub Code: 24VED201

UNIT IV **[8 Hours]**

Physical Fitness and Mental Harmony: Simplified Physical Exercise – Hand Exercises – Leg Exercises – Neuro Muscular Breathing Exercises – Eye Exercises – Kabalabathi – Maharasana A & B – Massage - Acupressure – Relaxation – Kayakalpa Yogam - LifeForce – Aim & Objectives – Principle – Methods. Introspection – Analysis of Thoughts – Moralization of Desires – Neutralization of Anger – Eradication of Worries.

UNIT V **[8 Hours]**

Yoga and Meditation – The Asset of India: Yogasanam – Rules & Regulations – Surya Namaskar – Asanas –Sitting – Stanging – Prone - Supine - Pranayama – Naadi Sudhi – Ujjayi – Seethali – Sithkari - Benefits. Meditation – Thanduvasudhi - Agna – Shanthi – Thuriyam – Benefits.

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion/Flipped Class//Peer learning/Experiential Learning/Blended Learning

Text Book

1. Value Based Education – Moral and Ethics – Published by Kongunadu Arts and Science College (Autonomous),2nd Edition (2021).

Reference Books

1. Swami Vivekananda – A Biography, Swami Nikhilananda, Advaita Ashrama, India, 24th Reprint 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. Easysteps to Yoga by Swami Vivekananda, A Divine Life Society Publication (2000).
5. Yoga Practices - 1 – The World Community Service Centre – Vethathiri Publications, Sixth Edition (2017), Erode.
6. Yoga Practices - 2 – The World CommunityService Centre – Vethathiri Publications – Eighth Edition (2017), Erode.

Question paper pattern

(External only)

Duration: 3 hrs Total Marks: 50

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

UCS 72

SUB CODE:24UHR3N1

Programme Code :	For B.A., BBA, B.Com, BCA and B.Sc., Degree Students		
PART IV –NON MAJOR ELECTIVE –I HUMAN RIGHTS			
Batch	**Hours / Week**	**Total Hours**	**Credits**
2024-2025	**2**	**30**	**2**

COURSE OBJECTIVES

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

COURSE OUTCOMES

After Completion of the Course the student will be able to

K1	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.
K5	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

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

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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

Books for Study:

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

REFERENCES:

1. Human Rights, (2018) by Jaganathan, MA.,MBA.,MMM.,ML.,ML., (Humanitarian Law) and J.P. Arjun Proprietor: Usha Jaganathan, Refugee Law
Law series, 1st floor, Narmatha 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
4. 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
   https://yourstory.com/2018/03/first-transgendre-college-principal-west-bengal
5. 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
(External Only)

Duration: 3 hrs **Max: 75 marks**

Section - A (5x5=25 Marks)
Short answer questions, either or type - one question from each unit.

Section - B (5x10=50 Marks)
Essay answer questions, either or type - one question from each unit.

UCS 74

24UWR4N2

Programme Code:	**For B.A., BBA, B.Com, BCA and B.Sc., Degree Students**		
	Part IV -NON- MAJOR ELECTIVE – II WOMEN'S RIGHTS		
Batch 2024-2025	**Hours / Week 2**	**Total Hours 30**	**Credits 2**

COURSE OBJECTIVES

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

COURSE OUTCOMES

After Completion of the Course the student will be able to

K1	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
K5	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.

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)**

Women's 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.

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24UWR4N2

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), compiled 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
(External Only)

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

SECTION A (5 x 5 = 25 marks)

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

SECTION B (5 x 10 = 50 marks)

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

UCS 76

Programme Code :	**For B.A., B.Sc., and BCA Degree Students**		
PART IV - NON- MAJOR ELECTIVE III - CONSUMER AFFAIRS			
Batch	**Hours/Week**	**Total Hours**	**Credits**
2024-2025	**2**	**30**	**2**

COURSE OBJECTIVES

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

COURSE OUTCOMES

K1	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.
K5	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,

UCS 77

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

i. Banking: RBI and Banking Ombudsman
ii. Insurance: IRDA and Insurance Ombudsman
iii. Telecommunication: TRAI
iv. Food Products: FSSAI
v. Electricity Supply: Electricity Regulatory Commission
vi. 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 rooms /Power Point Presentations / Seminars/Quiz /Discussion /Flipped Classrooms

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SUGGESTED READINGS:

1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi. (2007) Consumer Affairs, UniversitiesPress.
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, RegalPublications
4. Suresh Misra and Sapna Chadah (2012). Consumer Protection in India: Issues and Concerns, IIPA, NewDelhi
5. Rajyalaxmi Rao (2012), Consumer is King, Universal Law Publishing Company
6. Girimaji, Pushpa (2002). Consumer Right for Everyone Penguin Books.
7. E-books :-www.consumereducation.in
8. Empowering Consumers e-book,www.consumeraffairs.nic.in
9. ebook,www.bis.org
10. The Consumer Protection Act, 2086 and its later versions.

Question Paper Pattern(External Only)

Duration : 3 hrs Max : 75 marks

SectionA(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