DHANALAKSHMI SRINIVASAN
COLLEGE OF ARTS AND SCIENCE FOR WOMEN
(AUTONOMOUS)

(Affiliated to Bharathidasan University, Tiruchirappalli)
(Nationally Re-Accredited with A++ Grade by NAAC)
Perambalur – 621212

DEPARTMENT OF COMPUTER SCIENCE

U.G – B.Sc., Computer Science – course Structure Under – CBCS

Learning Outcomes Based Curriculum Framework (CBSC _ LOCF)

(For Candidates admitted from the Academic Year 2024 – 2025 onwards)

B.Sc., Computer Science									
Course Details							Scheme of Exams		
year/ Sem	Part	COURSE	Course Title	Course Code	Hrs	Cr	CIA	SE	Final
I YEAR/ I SEM	1	Language – I	Cheyyul (Ikkala Ilakkiyam), Sirukathai, Ilakkiyavaralaru	24U1LT1	5	3	25	75	100
		Hindi	Hindi	24U1LH1					
		French	French	24U1LF1					
	2	English-I	English for Communication - I	24U1EL1	5	3	25	75	100
	3	Core Course-I	Programming in C	24UCS1C1	6	5	25	75	100
	3	Core Course-II Practical	Programming in C Lab	24UCS1C2P	4	4	40	60	100
	3	Allied-I	Algebra and Calculus	24UCS1A1	5	4	25	75	100
	3	Allied -II	Numerical Methods and statistics	24UCS1A2	3	-	-	-	-
	4	Value Education	Value Education	24U1VED	2	2	25	75	100
	Total				**30**	**21**	**-**	**-**	**600**
I YEAR / II SEM	1	Language - II	Cheyyul (Idaikkala Ilakkiyam), Puthinam	24U2LT2	5	3	25	75	100
		Hindi	Hindi	24U2LH2					
		French	French	24U2LF2					
	2	English-II	English for Communication - II	24U2EL2	5	3	25	75	100
	3	Core Course- III	Programming in C++	24UCS2C3	6	5	25	75	100
	3	Core Course-IV Practical	Programming in C++ Lab	24UCS2C4P	4	4	40	60	100
	3	Allied-II	Numerical Methods and statistics	24UCS1A2	3	2	25	75	100
	3	Allied - III	Operation Research	24UCS2A3	5	4	25	75	100
	4	Environmental Studies	Environmental Studies	24U2EVS	2	2	25	75	100
	Total				**30**	**23**	**-**	**-**	**700**
II YEAR / III SEM	1	Language-III	Cheyyul(Kappiyangal), Urainadai , Aluval Murai Madalgal, Ilakkiyavaralaru	24U3LT3	5	3	25	75	100
		Hindi	Hindi	24U3LH3					
		French	French	24U3LF3					
	2	English-III	English for Communication - III	24U3EL3	5	3	25	75	100
	3	Core Course- V	Data Base Management System	24UCS3C5	6	5	25	75	100
	3	Core Course-VI Practical	RDBMS Lab	24UCS3C6P	4	4	40	60	100

	3	Allied Course - IV	Applied Physics – I	24UCS3A4	5	4	25	75	100
	3	Allied Course - V	Applied Physics Practical – I (Electronics)	24UCS3A5P	3	-	-	-	-
	4	NME-I	Basic Computer Concept	24UCS3N1A	2	2	25	75	100
			Introduction to Information Technology	24UCS3N1B					
			Office Automation	24UCS3N1C					
	Total				**30**	**21**	**-**	**-**	**600**
II YEAR / IV SEM	1	Language-IV	Cheyyul(Sanga Ilakkiyam, Needhi Ilakkiyam, Nadagam, Ilakkiya Varalaru,Podhu Katturai)	24U4LT4	5	3	25	75	100
		Hindi	Hindi	24U4LH4					
		French	French	24U4LF4					
	2	English-IV	English for Communication - IV	24U4EL4	5	3	25	75	100
	3	Core Course- VII	Java Programming	24UCS4C7	6	5	25	75	100
	3	Core Course-VIII Practical	Java Programming Lab	24UCS4C8P	4	4	40	60	100
	3	Allied Course – V	Applied Physics Practical – I (Electronics)	24UCS3A5P	3	2	40	60	100
	3	Allied Course - VI	Applied Physics - II	24UCS4A6	5	4	25	75	100
	4	NME-II	Internet and E-Commerce	24UCS4N2A	2	2	25	75	100
			Working Principles of Internet	24UCS4N2B					
			HTML Scripting Language	24UCS4N2C					
	Total				**30**	**23**	**-**	**-**	**700**
III YEAR / V SEM	3	Core course- IX	Python Programming	24UCS5C9	5	5	25	75	100
	3	Core Course- X Practical	Python Programming Lab	24UCS5C10P	6	4	40	60	100
	3	Core course- XI	Operating System	24UCS5C11	5	5	25	75	100
	3	Core course- XII	Data Structure and Algorithm	24UCS5C12	5	5	25	75	100
	3	MBE-1	Computer Architecture	24UCS5MBE1A	4	3	25	75	100
			Software Engineering	24UCS5MBE1B					
			Cyber Security	24UCS5MBE1C					
	3	Internship/Field Study/ Industrial Visit	Internship/Field Study/ Industrial Visit	24UCS5IS1	-	1			100
	4	SBE-1	InDesign	24UCS5SBE1A	3	2	25	75	100
			Corel Draw	24UCS5SBE1B					
			Designing using GIMP	24UCS5SBE1C					
	4	Soft Skills	Soft Skills	24U5SS	2	2	25	75	100
		Self-Paced Learning	Self-Pased Learning	24USPLI	-	2*			
	Total				**30**	**27**	**-**	**-**	**800**
III YEAR/ VI SEM	3	Core course- XIII	Web Technologies	24UCS6C13	6	5	25	75	100
	3	Core Course- XIV Practical	Web Technologies Lab	24UCS6C14P	6	4	40	60	100
	3	Core course- XV	Computer Networks	24UCS6C15	5	5	25	75	100
	3	MBE-2	Digital Computer Fundamentals &Microprocessor	24UCS6MBE2A	5	4	25	75	100
			Dot Net Concepts	24UCS6MBE2B					
			Basics of IOT	24UCS6MBE2C					
	3	Project work	Project work	24UCS5PW	4	3	40	60	100
	4	SBE-II	Dream Weaver	24UCS6SBE2A	3	2	25	75	100
			Illustrator	24UCS6SBE2B					

			3D Animation	24UCS6SBE2C					
	4	Gender studies	Gender studies	24U6GS	1	1	25	75	100
		Self-Paced Learning	Self-Paced Learning	24USPLII	-	2*			
	Total				**30**	**24**	**-**	**-**	**700**
I-VI	V		Extension Activities	-	-	1	-	-	-
Total(Three years)					**180**	**140**			**4100**

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CORE COURSE I - PROGRAMMING IN C

Semester : I **Max. Marks : 75**

Course Code : 24UCS1C1 **Credit : 5**

Total Periods : 90 **Exam Hrs. : 3**

Objectives:

1. To impart knowledge about the programming in c language
2. concepts of logical and informative manner.
3. Ability to use the functions efficiently
4. Implement on memory management and use of pointers
5. Ability to design and use structures

UNIT I **(15 Periods)**

C Fundamentals Character Set - Identifier and Keywords - Data Types - Constants - Variables - Declarations - Expressions - Statements - Arithmetic, Unary, Relational and Logical, Assignment and Conditional Operators - Library Functions.

UNIT II **(20 Periods)**

Data Input Output Functions - Simple C Programs - Flow of Control - If, If-Else, While, Do-While, For Loop, Nested Control Structures - Switch, Break and Continue, Goto Statements - Comma Operator.

UNIT III **(18 Periods)**

Functions -Definition - Prototypes - Passing Arguments – Function within a Function-Recursion - Types of Function – Advantage and Disadvantage of Function- Function Example Program.

UNIT IV **(20 Periods)**

Storage Classes - Automatic, External, Static, Register Variables .Arrays - Defining and Processing - Passing Arrays to functions - Multi-Dimension Arrays - Structures - User Defined Data Types-Unions Bitwise Operators.

UNIT V **(17 Periods)**

Pointers - Declarations - Passing Pointers to Functions - Operation on Pointers - Files: Creating, Processing, Opening and Closing a Data File.

TEXT BOOK:

1. Ashok N.Kamthane, Programming with ANSI and Turbo C, Pearson Education, 2006

EFERENCE BOOKS:

1. The C Programming Language: 1 January 2015 by Brian W. Kernighan / Dennis Ritchie (Second Edition)
2. PROGRAMMING IN C 3E Paperback – 28 August 2023 by Dr Reema Thareja (Author) third edition
3. Programming In Ansi C|8th Edition Paperback – Big Book, 25 March 2019 by E Balagurusamy (Author) Eighth Edition

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Knowledge on constructs of C Language	**K1**
CO2	Skills in writing C programs	**K2**
CO3	Ability to use the functions efficiently	**K3**
CO4	Skill on memory management and use of pointers	**K4**
CO5	Ability to design and use structures	**K4**

elationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course							Hours	Credits
I	24UCS1C1		PROGRAMMING IN C							6	5
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	3	2	2	2	2	3	1	2	2	2	2.1
CO-2	2	2	3	2	2	3	1	2	2	2	2.1
CO-3	3	2	2	2	1	3	2	2	2	3	2.2
CO-4	2	2	3	1	3	3	3	2	2	2	2.3
CO-5	2	2	3	1	2	2	3	2	2	2	2.1
Mean Overall Score											2.1 High

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CORE COURSE – II PRACTICAL - PROGRAMMING IN C LAB

Semester : I **Max. Marks : 60**

Course Code : 24UCS1C2P **Credit : 4**

Total Periods : 60 **Exam Hrs. : 3**

Objectives:

1. Understand C programming fundamentals.
2. Develop proficiency in using variables, operators, and control structures in C.
3. Implement functions and modular programming concepts in C.
4. Learn memory management and pointers in C.
5. Apply C programming for solving computational problems and practical applications.

Program List:

1. a) Program to find Simple Interest **(5 Periods)**

   b) Program to calculate area of rectangle, square and triangle **(5 Periods)**

2. a) Program to find odd or even of a given number **(4 Periods)**

   b) Program to find biggest of three numbers **(4 Periods)**

3. a) Program to find sum of digits of a given number **(4 Periods)**

   b) Program to find Factorial of a given number. **(4 Periods)**

4. a) Program to find the value of nCr using recursion. **(4 Periods)**

   b) Program to swap the two numbers using function and pointers. **(5 Periods)**

5. a) Program to perform matrix manipulations. **(5 Periods)**

   b) Program to sort the given numbers. **(5 Periods)**

6. a) Program to check the given string is palindrome or not

   (Without using string functions) **(5 Periods)**

   b) Program to print full pyramid of * pattern. **(5 Periods)**

7. Program to prepare a Mark Sheet using files. **(5 Periods)**

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Develop good understanding of the C language and the art of development in an environment	**K3**
CO2	Implement data structures and algorithms using C.	**K3**
CO3	Utilize C libraries and system calls effectively	**K4**
CO4	Develop skills in debugging and optimizing C code	**K4**
CO5	Apply C programming for system-level and embedded applications.	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
I	24UCS1C1P	PROGRAMMING IN C LAB								4	4
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	3	2	2	2	2	3	1	2	3	2	2.2
CO-2	2	2	3	2	2	3	1	3	2	2	2.3
CO-3	3	2	2	2	1	3	2	2	2	3	2.2
CO-4	2	2	3	1	3	3	3	2	2	2	2.3
CO-5	2	2	3	1	2	2	3	3	2	2	2.2
Mean Overall Score											2.2 High

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Semester	Course code	Title of the course	Hours	Credits
I	24UCA1A1/ 24UCS1A1	ALGEBRA AND CALCULUS	5	4

Objective:

To learn the basic concepts in the integration

UNIT I *(12 Periods)*

Theory of Equations: Relation between roots & coefficients – Transformations of Equations – Diminishing, Increasing & multiplying the roots by a constant- Forming equations with the given roots

UNIT II *(12 Periods)*

Matrices: Singular matrices – Inverse of a non-singular matrix using adjoint method - Rank of a Matrix – Characteristic equation, Eigenvalues, and Eigen vectors – Cayley Hamilton's Theorem (proof not needed) – problems.

UNIT III *(12 Periods)*

Differential Equations: Linear equations – Second order of types (a D^2 + b D + c) y =F (x) where a, b, c are constants and F (x) is one of the following types

(i) e^{Kx} (ii) $sin(kx)\ or\ cos(kx)$ (iii) x^n , n being an integer (iv) $e^{Kx}f(x)$ (v) $x^n\ sinax\ or\ x^n\ cosax$

UNIT IV *(12 Periods)*

Integration: Evaluation of integrals of types

$\int \frac{px+q}{ax^2+bx+c}$ $\int \frac{px+q}{\sqrt{ax^2+bx+c}}$ $\int \frac{dx}{a+bsinx}$ $\int \frac{dx}{a+bcosx}$ Evaluation using Integration by parts – Properties of definite integrals

UNIT V *(12 Periods)*

Reduction Formulae

$\int x^n e^{ax} dx$, n is a positive $\int \sin^n x\, dx$ $\int \cos^n x\, dx$ $\int \sin^m x \cos^n x\, dx$, m, n beingpositive integer.

TEXT BOOK(S)

1. A. Singaravelu, Allied Mathematics Edition 2007, Meenakshi Agency

UNIT I	-	Chapter 3
UNIT II	-	Chapter 2
UNIT III	-	Chapter 8
UNIT IV	-	Chapter 7
UNIT V	-	Chapter 12

BOOKS FOR REFERENCE

1. T.K. Manickavasagam Pillai& others, Algebra, Volume I, S.V Publication, 1985RevisedEdition
2. S. Narayanan,T.K. Manicavachagam Pillai, Calculus, I,S.Viswanathan Pvt Limited, 2003.

Course Outcomes:

CO No.	CO-STATEMENTS On the Successful completion of the course the student would be able to	Cognitive Levels (K-Levels)
CO 1	Understand the importance of roots of real and complex polynomials and learn various methods of obtaining roots	**K1**
CO 2	Solve systems of linear equations by use of the matrix	**K2**
CO 3	Discuss and demonstrate the Linear Equations with constant coefficients, Complementary function and Particular integrals.	**K3**
CO 4	Solving technique of integrals .	**K3**
CO 5	Define and illustrate the concept of the Reduction formula.	**K4**

Relationship matrix for Course outcomes, Programme outcomes/ Programme specific outcomes

Mapping with Programme Outcomes:

Semester	Course code	Title of the Course	Hours	Credits
I	**24UCA1A1/ 24UCS1A1/ 24UAI1A1**	**ALGEBRA AND CALCULUS**	**5**	**4**

Couse outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	2	3	2	2	2	2	3	2	3	2	2.3
CO-2	2	1	2	2	2	2	3	2	3	2	2.1
CO-3	2	2	1	2	3	2	3	2	3	2	2.2
CO-4	1	2	2	2	2	3	2	2	3	2	2.3
CO-5	2	2	2	1	3	3	2	2	3	2	2.2
Mean overall score											**2.2 High**

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CORE COURSE III - PROGRAMMING IN C++

Semester : II **Max. Marks : 75**

Course Code :24UCS2C3 **Credit : 5**

Total Periods : 90 **Exam Hrs. : 3**

Objectives:

1. Master object-oriented principles: classes, inheritance, polymorphism.
2. Efficient memory management using pointers and smart pointers.
3. Implement robust exception handling with try-catch blocks.
4. Utilize STL for data structures (vectors, maps) and algorithms.
5. Understand and apply concurrency concepts with threads and synchronization mechanisms.

UNIT I **(15 Periods)**

Principles Of Object-Oriented Programming: -Basic Concept Of Object Oriented Programming-Benefits Of Oops-Structure Of C++ Program- Tokens, Expressions, Control Statement: Tokens-Keyword-Identifier and Constants Basic Data Types In C++-Operators in C++.

UNITII **(20 Periods)**

Functions in C++: Introduction-Main Function-Function Prototype-Call by Reference-Return by Reference- inline Function-Friend Function-Virtual Function-Function Overloading-Classes and Objects: Structure of Class - Arrays within Class.

UNIT III **(20 Periods)**

Constructor and Destructor: Constructor – Multiple Constructor in Class – Copy Constructor – Dynamic Constructor – Destructor – Operator Overloading: Defining Operator Overloading – Manipulation of String Using Operators – Rules for Operator Overloading.

UNIT IV **(18 Periods)**

Inheritance: Single Inheritance - Multilevel Inheritance - Multiple Inheritance – Hierarchical Inheritance - Hybrid Inheritance - Pointers, Virtual Functions And Polymorphism: Pointers – Pointer to Objects – This Pointer – Virtual Function. Managing Console I/O Operations: Formatted I/O Operations - Unformatted I/O Operations.

UNIT V **(17 Periods)**

Working With Files: Classes For File Stream Operations - Opening And Closing aFile - End-Of-File Detection –Updating a File - Error Handling During File Operations. Exception Handling : Basics Of Exception Handling - Throwing Mechanism – Catching Mechanism.

TEXT BOOK:

1. Object Oriented Programming With C++ - E. Balagurusamy,4th Edition, Tata McGraw Hill Publishing, 2013.

REFERENCE BOOK:

1. Ashok N.Kamthane, Object Oriented Programming with ANSI and Turbo C++, Pearson Education, 2006.
2. Programming Principles and Practice Using C++ (2nd Edition) by Bjarne Stroustrup, 2014.
3. C++ Primer (5th Edition) by Stanley B. Lippman, Josée Lajoie, Barbara E. Moo **,** 2012.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the basic concepts in C++ Programming	**K1**
CO2	Understand the principles of Object-Oriented Concepts	**K2**
CO3	Be skill full in writing C++ code using classes objects and functions	**K3**
CO4	Know the Core concepts of OOPS such as Constructors and Inheritance	**K3**
CO5	Understand the concept of streams and file management in C++	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course							Hours	Credits
II	24UCS2C2		PROGRAMMING IN C++							6	5
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	3	2	2	2	2	3	1	2	3	2	2.2
CO-2	2	2	3	2	2	3	1	3	2	2	2.3
CO-3	3	2	2	2	1	3	2	2	2	3	2.2
CO-4	2	2	3	1	3	3	3	2	2	2	2.3
CO-5	2	2	3	1	2	2	3	2	2	2	2.1
Mean Overall Score											2.2 High

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CORE COURSE - IV PRACTICAL - PROGRAMMING IN C++ LAB

Semester : II **Max. Marks :60**

Course Code : 24UCS2C4P **Credit : 4**

Total Periods : 60 **Exam Hrs. : 3**

Objectives:

1. To impart practical knowledge about the programming in C++ lab
2. Define and manipulate various data types including integers, floats, and characters.
3. Implement decision-making with if-else and switch statements.
4. Create and call functions, pass parameters, and return values.
5. Declare and manipulate arrays, understand indexing and traversal.

Program:

1. a) Program to find factorial of a given number. **(5 Periods)**

b) Program to convert dollars to rupees. **(5 Periods)**

2. a) Define a class to represent a bank account. **(5 Periods)**

b) Consider a shopping list of items for which orders are placed with a dealer. **(5 Periods)**

3. a) Program to find the largest of three numbers using inline function. **(5 Periods)**

b) Program to find mean of 'N' numbers using friend function. **(5 Periods)**

4. a) Program to find volume of cube, cylinder and rectangular box using function overloading. **(5 Periods)**

b) Program to add two times in hours and minutes format using objects as function arguments. **(5 Periods)**

5. Program to illustrate the use of arrays of objects. **(5 Periods)**

6. Program to add two complex numbers using **(5 Periods)**

a) Overloaded Constructors b) Operator Overloading

7. Program to check whether the given string is a palindrome or not using pointer method. **(5 Periods)**

8. Program to read the derived class data members such as name, roll number, sex, height and weight from the keyboard and display the contents of a class on the screen. **(5 Periods)**

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Provide a sound understanding of the basic concepts of OOPs	K3
CO2	Equip the students with the knowledge of classes and objects	K4

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course							Hours	Credits
II	24UCS2C2P		PROGRAMMING IN C++ LAB							4	4
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	3	2	3	2	2	3	1	2	3	2	2.3
CO-2	2	2	3	2	2	3	1	2	2	2	2.1
CO-3	3	2	2	2	1	3	2	2	2	3	2.2
CO-4	2	2	3	1	3	3	3	2	2	2	2.3
CO-5	2	2	3	1	2	2	2	2	3	2	2.1
Mean Overall Score											2.2 High

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Semester	Course code	Title of the course	Hours	Credits
I & II	24UCA1A2/24UCS1A2	NUMERICAL METHODS AND STATISTICS	6	2

Objective:

To train the students in the numerical problems

UNIT I ***(12 Periods)***

Algebraic & Transcendental equations: Bisection Method, Iteration method, Newton Raphson Method, - Finite differences –Forward, Backward differences –Newton's forward & backward difference interpolation formulae.

UNIT II ***(12 Periods)***

Numerical differentiation -Cubic Spline method- Numerical Integration using Trapezoidal rule and Simpson's 1/3rd& 3/8th rules (proof not needed) – Numerical solution of ODE: Solution by Taylor Series Method, Euler's Method, Runge - Kutta $2^{nd}$and 4^{th}order method.

UNIT III ***(12 Periods)***

Gaussian Elimination Method – Jacobi & Gauss Seidel iterative methods – Theory and problems

UNIT IV ***(12 Periods)***

Arithmetic Mean - Median, Mode, Geometric mean, Harmonic mean, Range, Quartile Deviation, Standard Deviation, Coefficient of variance.

UNIT V ***(12 Periods)***

Correlation: Meaning of Correlation, Limits for Correlation Coefficient - Types of Correlation, Coefficient of correlation – Karl's Pearson & Spearman's Rank Correlation.

TEXT BOOK(S)

1. S.S. Sastry, Introductory methods of Numerical Analysis, 3^{rd} Edition, New Delhi,Sep 1999.
2. Gupta.S.C & Kapoor, V.K, Fundamentals of Mathematical Statistics, Sultan Chand & sons, New Delhi -1994.

UNIT I - Chapter 2, 3 of [1] (Sec 2.2,2.3, 2.5 & 3.3.1, 3.3.2, 3.6)

UNIT II - Chapter 5, 6, 7 of [1] (Sec 5.2.2, 5.4.1-5.4.3 & 6.3.2 & 7.2, 7.4, 7.5)

UNIT III - Chapter 6, 8 of [1] (Sec 6.3.2, 8.3.1, 8.3.2)

UNIT IV - Chapter 2, 3 of [2] (Sec 2.5 to 2.9 & 2.13.1, 2.13.2, 2.13.4, 2.14.1)

UNIT V - Chapter 10 of [2] (Sec 10.2, 10.4, 10.7)

BOOKS FOR REFERENCE

1. M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Private Limited,1999.
2. C.E. Froberg, Introduction to Numerical Analysis, II Edn., Addison Wesley,1979

Course Outcomes:

CO No.	CO-STATEMENTS On the Successful completion of the course the student would be able to	Cognitive Levels (K-Levels)
CO 1	Evaluate algebraic and transcendental equation using numerical methods.	**K1**
CO 2	Evaluate finite integrals using Trapezoidal and Simpsons rule and Solve differential equation and integration.	**K2**
CO 3	Find the solution of linear system of equation by Gaussian Elimination, Method of Factorization, Gauss Jacobi, Gauss Seidel Methods.	**K3**
CO 4	Categorize and evaluate various measures of central tendency.	**K3**
CO 5	Calculate correlation and regression.	**K4**

Relationship matrix for Course outcomes, Programme outcomes/ Programme specific outcomes

Mapping with Programme Outcomes:

Semester	Course code		Title of the Course							Hours	Credits
I &II	24UCA1A2/24UCS1A2		NUMERICAL METHODS AND STATISTICS							6	2
Couse outcomes	Programme outcomes(POs)					Programme Specific Outcomes(PSOs)					Mean scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	3	2	2	2	2	3	2	3	2	2.3
CO-2	2	1	2	2	2	2	3	2	3	2	2.1
CO-3	2	2	1	2	3	2	3	2	3	2	2.2
CO-4	1	2	2	2	2	3	2	2	3	2	2.3
CO-5	2	2	2	1	3	3	2	2	3	2	2.2
Mean overall score											2.2 (High)

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Semester	*Course code*	*Title of the course*	*HOURS*	*CREDITS*
II	*24UCA2A3/24UCS2A3*	*OPERATION RESEARCH*	*5*	*3*

Objective:

To train the students to solve assignment problems, transportation problems.

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UNIT I **(12 Periods)**

Operations Research: Introduction - Basics of OR – OR & decision making – Role of Computers in OR - Linear programming formulations & graphical solution of two variables– Canonical & standard forms of LPP.

UNIT II **(12 Periods)**

Game Theory: Introduction-Game with Pure Strategies-Game with Mixed Strategies-Dominance Property-Graphical Method For 2xn Or Mx2 Games

UNIT III ***(12 Periods)***

Transportation problem: North West Corner Method – Least Cost Method – Vogel's Approximation Method -Assignment Problem: Hungarian assignment problem.

UNIT IV ***(12 Periods)***

Sequencing problem: Processing of n jobs through two machines – Processing ofnjobsthrough3machines–processing of two jobs through machines.

UNIT V ***(12 Periods)***

Networks: Network – Fulkerson's rule - measure of activity – PERT computation – CPM computation - Resource scheduling.

TEXT BOOK(S)

1. S. Kalavathy, Operations Research Vikas Publishing House Pvt Ltd.

UNIT I - Chapter 1 [1], Chapter 2 [2]
UNIT II - Chapter 17 [2]
UNIT III - Chapter 8 [2]
UNIT IV - Chapter 12 [2]
UNIT V - Chapter 13 [2]

BOOKS FOR REFERENCE

1. Prem Kumar Gupta and D.S. Hira, Operations Research: An Introduction, S. Chand and Co., Ltd. New Delhi,
2. Hamdy A. Taha, Operations Research (7^{th} Edn.), McMillan Publishing Company,New Delhi,1982.
3. Manmohan & Gupta, Operations Research, Sultan Chand Publishers, New Delhi

Course Outcomes:

CO No.	CO-STATEMENTS On the Successful completion of the course the student would be able to	Cognitive Levels (K-Levels)
CO 1	Recognize and relate LPP and solving LPP using graphical method.	**K1**
CO 2	Compute Simplex Algorithm, Two Phase Method and Big-M Method of LPP	**K2**
CO 3	Explain Transportation problem and evaluate its initial basic feasible solution	**K3**
CO 4	Discuss and solve sequencing and machine problems.	**K3**
CO 5	Describe and Construct Network and compute PERT and CPM	**K4**

Relationship matrix for Course outcomes, Programme outcomes/ Programme specific outcomes

Mapping with Programme Outcomes:

Semester	Course code		Title of the Course							Hours	Credits
II	**24UCA2A3/24UCS2A3**		**OPERATION RESEARCH**							**5**	**4**
Couse outcomes	**Programme outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean scores of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO-1	2	3	2	2	2	2	3	2	3	2	2.3
CO-2	2	1	2	2	2	2	3	2	3	2	2.1
CO-3	2	2	1	2	3	2	3	2	3	2	2.2
CO-4	1	2	2	2	2	3	2	2	3	2	2.3
CO-5	2	2	2	1	3	3	2	2	3	2	2.2
Mean overall score											**2.2 (High)**

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CORE COURSE V–DATA BASE MANAGEMENT SYSTEM

Semester : III **Max. Marks : 75**

Course Code :24UCS3C5 **Credit : 5**

Total Periods : 90 **Exam Hrs. : 3**

Objective:

1. Introducing the concepts and components of database management systems.
2. Understanding tables, keys, relationships, and normalization techniques.
3. Proficiency in SQL for data querying, manipulation, and schema definition.
4. Skills in designing databases using ER diagrams and converting them into relational schemas.
5. Learning essential tasks such as security management, transaction control, and backup strategies.

UNIT I **(18 Periods)**

Introduction: Flat File - Database System - Database - Actionable for DBA.The Entity - Relationship Model: Introduction - The Entity Relationship Model. Data Models: Introduction - Relational Approach -The HierarchicalApproach - The Network Approach.

UNIT II **(18 Periods)**

Storage Structure: Introduction - File Organization and Addressing Schemes. Relational Data Structure: Introduction - Relations - Domains.

UNIT III **(18 Periods)**

Normalization: Introduction - Normalization - Definition of FunctionalDependence (FD) - Normal Forms: 1NF, 2NF, 3NF and BCNF.

UNIT IV **(18 Periods)**

Structured Query Language: Features of SQL - Select SQL Operations -Grouping the Output of the Query - Querying from Multiple Tables – RetrievalUsing Set operators - Nested Queries. T-SQL

UNIT V **(18 Periods)**

Procedural Language- SQL: PL/SQL Block Structure - PL/SQL Tables. Cursor Management and Advanced PL/SQL: Opening and Closing a Cursor -Processing Explicit Cursor - Implicit Cursor - Exception Handlers – SubPrograms in PL/SQL - Functions - Precaution While Using PL/SQL Functions- Stored Procedure –DB Triggers-Object Oriented Technology.

TEXT BOOK:

1. Rajesh Narang, “Database Management Systems”, PHI Learning Private Limited, New Delhi, sixth printing, 2010.

REFERENCE BOOK:

1. S.K. Singh, “Database Systems - Concept, Design and Applications”, Dorling Kindersley (India) Pvt. Ltd., Second Impression, 2008.
2. "Database Management Systems" by Raghu Ramakrishnan and Johannes Gehrke, 2020
3. "Database Systems: The Complete Book" by Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer Widom, 2022

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamental concepts of database systems & use the features available in a DBMS package	**K2**
CO2	Know the organization of File and its addressing schemes	**K3**
CO3	Acquire knowledge on Normalization	**K3**
CO4	Develop the logical design of the database using data modeling concepts such as Entity Relationship diagrams	**K4**
CO5	Familiarity on SQL queries, functions, cursors and triggers	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course							Hours	Credits
III	24UCS3C3	DATA BASE MANAGEMENT SYSTEM							6	5
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean scores of Cos
CO-1	2	2	3	3	2	3	2	2	3	1	2.3
CO-2	2	2	3	2	2	3	2	1	2	2	2.1
CO-3	2	2	3	2	1	2	2	3	3	2	2.2
CO-4	2	1	3	2	3	2	3	2	2	3	2.3
CO-5	2	1	2	2	3	2	2	2	3	2	2.1
Mean Overall Score											2.2 High

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CORE COURSE - VI PRACTICAL - RDBMS LAB

Semester : III **Max. Marks :60**

Course Code :24UCS3C6P **Credit : 4**

Total Periods : 60 **Exam Hrs. : 3**

Objective:

1. Master SQL commands for data manipulation and querying.
2. Apply normalization techniques to create efficient relational database schemas.
3. Implement indexing and analyze query plans for performance improvement.
4. Implement constraints and transactions for ensuring data consistency.
5. Learn backup, recovery, and security management in RDBMS environments.

SQL

1. Table Creation, data Insertion, Deletion, Updating and Selection. **(6 Periods)**

2.DML: Operators (Arithmetic, Relational, Logical), SQL Functions (SingleRowFunction, Group Functions). **(6 Periods)**

3. DML: Set operations, Join operations **(6 Periods)**

4. Nested queries **(6 Periods)**

5. Creation of Synonym, Sequence & Index, Creation and manipulation ofViews. **(6 Periods)**

PL/SQL

6. PL/SQL- block **(6 Periods)**

7. Cursors **(6 Periods)**

8. Functions & Procedure **(6 Periods)**

9. Packages **(6 Periods)**

10. Triggers **(6 Periods)**

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Apply PL/SQL for query processing	**K3**
CO2	Use PL/SQL stored procedure, stored functions, cursors and packages to query the database	**K3**
CO3	Ability to design efficient relational database schemas.	**K3**
CO4	Implement indexing and analyze query performance.	**K4**
CO5	Acquire skills in database backup, recovery	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course							Hours	Credits
III	24UCS3C3P		RDBMS LAB							4	4
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	3	2	3	2	2	3	2	1	3	2.3
CO-2	2	3	2	2	3	2	3	2	2	2	2.3
CO-3	2	3	2	1	2	3	2	3	2	3	2.3
CO-4	2	3	1	3	2	2	2	3	3	3	2.4
CO-5	1	2	2	3	2	2	3	2	3	2	2.2
Mean Overall Score											2.3 High

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ALLIED COURSE – IV APPLIED PHYSICS-I

(For Computer Science Students)

Semester : III **Max.Marks :75**

Course Code : 24UCS3A4 **Credit :4**

Total Periods : 75 Periods **Exam Hours :3 Objective :**

- To bring out the subjects related with the computer field which help students to keep pace with these topics.

UNIT I : Current Electricity (15Pds.)

Ohm's Law- Verification of Ohm's Law-Kirchhoff's law- Applications of Kirchhoff's law-Whetstone's bridge - Meter bridge- Carey Foster's bridge- Potentiometer- Measurement of Current and Resistance- Calibration of low range Voltmeter.

UNIT II : Alternating Current (15 Pds.)

Introduction to capacitance inductance and resistance - AC circuits with double components – measurement of current and voltage – power in an AC Circuit-Power Factor (derivation)- Wattles current – Choke - series and parallel resonant circuits.

UNIT III : Semiconductor Memories (15 Pds.)

Introduction – ROM using diodes and transistors – ROM in terms of digital circuits – Building memory of larger capacity – PROM – EPROM – EEPROM – ROM as a unit in microcomputers – RAM – Static RAM – Flip – Flop as a RAM cell – Memory expansion _ Memory Parameters.

UNIT IV : Number Systems, Codes and Logic gates (15 Pds.)

Number Systems - Conversions - Binary: Addition, Subtraction, Multiplication, Division-8421 Code - BCD Code - Excess 3 code - Gray code - Binary to Gray and Gray to Binary Conversion– Basic and Derivative Gates: AND, OR, NOT, NAND, NOR, EX-OR - NAND & NOR as Universal Gates.

UNIT V : Boolean algebra, Arithmetic and Combinational Logic Circuits (15 Pds.)

Basic laws of Boolean algebra - De Morgan's theorem - Verification of Boolean expression using Boolean laws - Half-adder - Full adder – Half –Subtractor – Full – subtractor (using basic gates).

Books for Study:

1. Narayanamurthi and Nagarathinam, Electricity and Magnetism, The National Publishing Company, Madras, 1994.
2. Brijlal & Subramanian, Electricity and Magnetism, Ratan Prakashan Mandir, 1995.

3. uri V.K., Digital Electronics circuits and systems, TATA Mcgraw hill publications, New Delhi, 2011.

4. Vijayendran. V & Subramanian. V, Introduction to Integrated Electronics, S. Viswanath PVT Ltd., Chennai 2012.

Books for Reference:

1. Murugeshan. R, Electricity and Magnetism, S. Chand & Company Ltd., 2015.
2. Gothaman W.H., Digital Electronics, Prentice Hall of India PVT., New Delhi, 1996.
3. Sanjay D Jain, Applied Physics, Universities Press, Hyderabad, Telengana.

COURSE OUTCOME

CO NUMBER	CO STATEMENT	NOWLEDGE LEVEL
CO1	Understood ohms law in electricity and Kirchhoff's laws, working of electrical instruments and its principle.	K2
CO2	Knowledge about AC circuits with double components, and analyze the meaning of choke, wattles current, types of resonant circuits.	K3
CO3	Acquire knowledge about memory devices in computers and types of memory devices of RAM, ROM and Memory parameters.	K4
CO4	Understood types of number systems, internal code conversion, and basic logic gates working and they get knowledge about verifying truth tables .	K2
CO5	Know about simplify Boolean algebra, and acquire knowledge about arithmetic and logical combinational circuits and its uses.	K2

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
III	24UCS3A4	APPLIED PHYSICS-I								5	4
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	3	3	2	3	2	2	2	3	3	2	2.5
CO-2	3	2	3	2	2	2	3	3	2	2	2.4
CO-3	3	2	3	2	3	2	3	3	2	2	2.5
CO-4	3	3	3	2	1	3	2	2	3	2	2.4
CO-5	3	2	3	2	3	2	3	2	2	3	2.5
Mean Overall Score											2.46 High

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NON-MAJOR ELECTIVE I -BASIC COMPUTER CONCEPTS

Semester : III **Max. Marks : 75**

Course Code : 24UCS3N1A **Credit : 2**

Total Periods : 30 **Exam Hrs. : 3**

Objectives: To impart knowledge about the fundamental concepts of computers in a logical and informative manner.

UNITI (6 Periods)

Introduction: Characteristics of Computers – The Evolution of Computers – The Computer Generations. Basic Computer Organization: Input Unit – Output Unit - Storage Unit – Arithmetic Logic Unit – Control Unit – The Central Processing Unit. Processor and Memory: The Main Memory.

UNIT II (6 Periods)

Secondary Storage Devices: Sequential and Direct Access Devices – Magnetic Disk - Optical Disk – CD-ROM. Input-Output Devices: Input Devices: Keyboard – Point-and-Draw Devices – Data Scanning Devices – Electronic-Card Reader. Output Devices: Monitors – Printers – Plotters. Computer Software: Types of Software.

UNITIII (6 Periods)

Operating Systems: Main Functions of an Operating System. Business Data Processing: Data Processing – Data Storage Hierarchy – Standard Methods of Organizing Data – File Management System: File Types – File Organizations – Database Management System: Database Models.

UNITIV (6 Periods)

The Internet: Definition- Basic Services: Electronic Mail – File Transfer Protocol – Telnet - The World Wide Web. WWW Browsers – Uses of the Internet. Multimedia: Multimedia Computer System – Multimedia Components – Multimedia Applications.

UNITV (6 Periods)

Getting Familiar with Photoshop – Working With Images and Selection.

TEXT BOOK:

1. Pradeep K. Sinha and PritiSinha, Computer Fundamentals,BPB Publications, Third Edition, 2017.
2. Comdex DTP Course Kit - Vikas Gupta, Dreamtech press, 2010.

REFERENCE BOOK:

1. Introduction to Computers – Alexis Leon, Vikas Publication.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the concept of Evolution and Characteristics of computer	**K2**
CO2	Understand the concept of input, output and storage devices of Computers	**K3**
CO3	Acquire the knowledge of Operating system and Database Management system	**K4**
CO4	Identify the uses of Internet and Multimedia	**K4**
CO5	Able to do editing works using Photoshop	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
III	24UCS3N1A	BASIC COMPUTER CONCEPTS								2	2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	3	2	2	3	2	2	1	2	2.1
CO-2	3	3	2	3	2	1	3	3	3	2	2.5
CO-3	3	2	3	2	3	1	3	3	3	3	2.6
CO-4	3	2	3	2	3	3	2	2	3	2	2.5
CO-5	3	2	3	2	3	3	2	2	3	3	2.6
Mean Overall Score											2.46 HIGH

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NON MAJOR ELECTIVE I - INTRODUCTION TO INFORMATION TECHNOLOGY

Semester : III **Max. Marks :75**

Course Code : 24UCS3N1B **Credit : 2**

Total Periods : 30 **Exam Hrs. : 3**

Objective: To understand the introduction to information technology.

UNIT I **(6Periods)**

Introduction: History of Computer -Parts of Computer System -Hardware Devices -Software - Operating System -Examples of Operating Systems -Computer Networking -Visual Editor.

UNIT II **(6 Periods)**

Microsoft Word -Microsoft Excel -Microsoft PowerPoint

UNIT III **(6 Periods)**

Introduction to Multimedia -Images -Sound -Video Desktop Publishing Basics -Page Layout Programs -Text Generation -Graphics for DTP -Print Production.

UNIT IV **(6 Periods)**

Introduction to Internet -Working of Internet-Internet Services -Internet Addressing -E-Mail Basics-Web Development Tools-Introduction to HTML

UNIT V **(6 Periods)**

Information System -Management Information Concepts -Planning Issues and the MIS -Organizing Issues and the MIS -Control Issues and the MIS -Decision Support Systems.

TEXT BOOK:

1. Sanjay Saxsena, “A First Course in Computer”, Vikas Publishing House, 2000

REFERENCE BOOKS:

1. Ron Mansfield, “Working in Microsoft Office”,TataMcgraw Hill, 1997
2. Linda Tway, Sapphiro Pacific Lajolla, “Multimedia in Action”, Academic Press,1995
3. Neil randal “Teach yourself the internet in a week”, Prentice Hall of India, Second Edition, 1996.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand basic concepts and terminology of information technology	**K2**
CO2	Understand the personal computers and their operations	**K2**
CO3	Able to identify issues related to information security	**K3**
CO4	Should be able to identify some of the instances in daily life where a *computer* is, or is likely to be, involved	**K4**
CO5	Apply the knowledge of mathematics, science and computing in all fields	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
III	24UCS3N1B	INTRODUCTION TO INFORMATION TECHNOLOGY								2	2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	3	3	2	3	3	2	2	2	2	2.4
CO-2	3	2	3	3	2	2	3	3	3	2	2.6
CO-3	3	3	2	3	3	2	3	3	3	3	2.8
CO-4	3	2	3	3	3	3	2	3	3	2	2.7
CO-5	3	2	3	2	3	3	2	2	3	3	2.6
Mean Overall Score											2.62 HIGH

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NON MAJOR ELECTIVE I - OFFICE AUTOMATION

Semester : III **Max. Marks :75**

Course Code :24UCS3N1C **Credit : 2**

Total Periods : 30 **Exam Hrs. : 3**

Objective: To understand the basics of office automation.

UNIT I **(6 Periods)**

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

UNIT II **(6 Periods)**

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

UNIT III **(6 Periods)**

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

UNIT IV **(6 Periods)**

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

UNIT V **(6 Periods)**

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

TEXT BOOK:

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

REFERENCE BOOK:

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

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand basic components of computer and devices	**K2**
CO2	Able to perform documentation	**K3**
CO3	Able to perform accounting operations	**K3**
CO4	Able to perform presentation skills	**K4**
CO5	Apply the knowledge on various subjects	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
III	24UCS3N1C	OFFICE AUTOMATION								2	2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	3	2	2	2	2	2	2	2	2.1
CO-2	2	2	2	3	2	2	2	3	3	2	2.3
CO-3	2	3	2	2	3	2	3	2	2	2	2.3
CO-4	3	3	3	2	2	3	2	2	2	2	2.4
CO-5	3	2	1	3	3	2	1	2	2	3	2.2
Mean Overall Score											2.26 High

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CORE COURSE VII - JAVA PROGRAMMING

Semester : IV **Max. Marks : 75**

Course Code : 24UCS4C7 **Credit : 5**

Total Periods : 90 **Exam Hrs. : 3**

Objectives:

1. Learn Java syntax, variables, data types, and control structures.
2. Understand classes, objects, inheritance, and polymorphism.
3. Implement error handling using try-catch blocks.
4. Utilize standard Java APIs for input/output and collections.
5. Build basic Java applications including console-based and simple GUI programs.

UNIT I **(16 Periods)**

Fundamentals of Object Oriented Programming – Java Evolution – Overview of Java Language – Constants, Variables and Data types – Operators and Expressions – Branching and Looping Statements.

UNIT II **(18 Periods)**

Classes, Objects and Methods – Defining a Class-Creating Objects – Constructors -Method Overloading – Static Members – Inheritance: Extending a Class – Overriding Methods – Final Classes – Abstract Methods and Classes – Visibility Control – Arrays, Strings and Vectors: One-Dimensional Arrays – Creating an Array – Two-Dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types.

UNIT III **(19 Periods)**

Interfaces: Multiple Inheritance : Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables – Packages : Java API Package – Creating and Accessing Packages – Hiding Classes – Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority.

UNIT IV **(18 Periods)**

Managing Errors and Exceptions: Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing Our Own Exceptions – Managing Input/output Files in Java - Stream Classes – Character Stream, Byte Stream – Using Streams – Using the File Classes – Input/output Exceptions – Creation of Files – Reading/Writing Characters – Reading/Writing Bytes – Handling Primitive Data Types – Random Access Files – Interactive Input and Output.

UNIT V **(19 Periods)**

Applet Programming: How Applets Differ from Applications – Building Applet Code – Applet Life Cycle – Creating an Executable Applet – Applet Tag – Adding Applet to HTML File – Running the Applet – Passing Parameters to Applets – Displaying Numerical Values – Getting Input from the User –

Event Handling – Graphics Programming – The Graphics Class – Introduction to AWT Package – Introduction to Swings.

TEXT BOOK:

E. Balagurusamy, Programming with Java a Primer, TMH, Fourth Edition, 2010.

REFERENCE BOOK:

1. P. Radha Krishna, Object Oriented Programming through Java, University Press (India) Private Ltd., 2007.
2. "Effective Java" by Joshua Bloch, 2018.
3. "Java: The Complete Reference" by Herbert Schildt,2021

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Gain ability to develop basic programming skills in Java	**K1**
CO2	Acquire fundamental knowledge in Object Oriented Programming	**K2**
CO3	Ability to generate simple packages and to design Thread	**K3**
CO4	Attain knowledge in various File Handling Techniques.	**K4**
CO5	Acquire ability to design and execute simple Applets.	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course							Hours	Credits
IV	24UCS4C4	JAVA PROGRAMMING							6	5
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean scores of Cos
CO-1	2	3	2	2	3	2	1	2	3	3	2.3
CO-2	2	3	2	3	2	2	2	2	3	2	2.3
CO-3	2	2	3	2	1	3	3	2	2	3	2.3
CO-4	2	3	1	3	2	2	3	2	3	3	2.4
CO-5	2	1	3	2	2	2	3	3	2	2	2.2
Mean Overall Score											2.3 High

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CORE COURSE – VIII PRACTICAL - JAVA PROGRAMMING LAB

Semester	**: IV**	**Max. Marks**	**: 60**
Course Code	**: 24UCS4C8P**	**Credit**	**: 4**
Total Periods	**: 60**	**Exam Hrs.**	**:3**

Objectives: To impart the practical knowledge about Java Programming languages.

1. Learn Java syntax, variables, and basic control structures.
2. Understand classes, objects, and basic inheritance.
3. Implement basic error handling using try-catch blocks.
4. Utilize Java APIs for input/output operations and collections.
5. Build simple Java applications including command-line and basic GUI programs.

Programs:

1. Write simple programs to demonstrate **(6 Periods)**
a) The various forms of inputs in Java b) Operators and expressions
c) Control statements
2. Write a Java Program to define a class, describe its constructor, and instantiate its Object **(4 Periods)**
3. Write a Java Program to demonstrate method overloading **(4 Periods)**
4. Write a Java Program to demonstrate single and two Dimensional arrays. **(5 Periods)**
5. Write a Java program to demonstrate various methods in the String and StringBufferclass. **(4 Periods)**
6. Write a Java Program to print Pascal's triangle. **(4 Periods)**
7. Write a Java Program to implement single inheritance **(4 Periods)**
8. Write a Java Program to implement multiple inheritances **(3 Periods)**
9. Write a Java program to implement the concept of importing classes from user defined package and creating packages. **(5 Periods)**
10. Write a Java program to implement the concept of threading by using Thread class and Runnable interface. **(4 Periods)**
11. Write a Java program to implement the concept of Exception Handling. **(4 Periods)**
12. Write a Java program using Applet **(5 Periods)**
a) To display a message) For passing parameters.
13. Write a Java programs for using Graphics class to display basic shapes and fill them and set background and foreground colors. **(4 Periods)**
14. Write a Java program to demonstrate use of I/O streams. **(4 Periods)**

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Generate ability to generate simple packages and to design Thread	**K3**
CO2	Acquire skills and knowledge in various File Handling Techniques	**K4**
CO3	Master Java syntax, variables, and basic control flow	**K3**
CO4	Implement robust error handling using try-catch blocks	**K4**
CO5	Create functional Java programs for real-world scenarios.	**K4**

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Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course							Hours	Credits
IV	24UCS4C4P		JAVA PROGRAMMING LAB							4	4
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	3	2	2	3	2	1	2	3	3	2.3
CO-2	2	3	2	3	2	2	2	2	3	2	2.3
CO-3	2	2	3	2	1	3	3	2	2	3	2.3
CO-4	2	3	1	3	2	2	3	2	3	3	2.4
CO-5	2	1	3	2	2	2	3	3	2	2	2.2
Mean Overall Score											2.3 High

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ALLIED COURSE PRACTICAL –V

APPLIED PHYSICS PRACTICAL –I (ELECTRONICS)

(For Computer Science Students)

Semester : IV **Max.Marks: 60**

Course Code: 24UCS3A5P **Credit : 2**

Total Periods: 90 Periods **Exam Hours:3**

Objective:

- To promote the exhaustive requirements and expectations of the students to acquire practical knowledge for the theory given in their syllabus.

LIST OF EXPERIMENTS: (ANY 12)

1. Draw the Characteristics curve for Semi-Conductor diode.
2. Draw the Characteristics curve for Zener diode.
3. Find the FET- Characteristics.
4. Find the Transistor Characteristics of CE configuration.
5. Find the Transistor Characteristics of CB Configuration.
6. Determine the Specific Resistance of Metre Bridge
7. Calibration of low range voltmeter using Potentiometer.
8. Find the Specific Resistance of given coil using Carey Foster's Bridge.
9. LCR - Series resonance circuit
10. LCR - Parallel resonance circuit
11. Logic Gates (AND, OR, NOT, NAND, NOR and EX-OR) Using IC's.
12. NAND and NOR as Universal Gates.
13. Half –Adder and Half –Subtractor using logic gates.

Books for Study:

1. Somasundaram S., Practical Physics, Apsara Publications, Tiruchirappalli.2012.

Books for Reference:

1. Department of Physics, Practical Physics, (B. Sc Physics Main), St. Joseph's College, Tiruchirappalli 1998.

COURSE OUTCOME

CO NUMBER	CO STATEMENT	NOWLEDGE LEVEL
CO1	Find the appropriate data accurately and keep systematic record of laboratory activities.	K2
CO2	Demonstrate the usage of equipment's for various measurements.	K2
CO3	Develop practical knowledge by applying the experimental methods to correlate with the Physics theory.	K4
CO4	Utilize standard methods to measure the young's modulus of the given material.	K2
CO5	Build hands on experience using various techniques.	K3

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
IV	24UCS3A5P	APPLIED PHYSICS PRACTICAL –I								6	2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	3	2	3	2	2	2	2	3	2	2.3
CO-2	2	2	3	2	2	2	3	3	2	2	2.3
CO-3	2	2	3	3	3	2	3	3	1	3	2.5
CO-4	3	2	3	2	2	3	2	1	3	2	2.3
CO-5	2	2	3	2	3	2	2	2	2	3	2.3
Mean Overall Score											2.34 High

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ALLIED COURSE –VI APPLIED PHYSICS-II

(For Computer Science Students)

Semester : IV **Max.Marks : 75**

Course code :24UCS4A6 **Credit : 4**

Total Periods: 75 Periods **Exam Hrs.: : 3**

Objective:

- To understand the rapid growth of electronic technology and simplify the learning process to a greater extent.

UNIT I: Semiconductor Physics (15 Pds.)

Theory of energy bands in crystals- Distinction between conductors, Insulators and Semiconductors – Intrinsic and Extrinsic semiconductors – Hall effect in semiconductor– Zener diode –Tunnel diode - Backward diode - Breakdown voltage-avalanche Breakdown

UNIT II: Transistors (15 Pds.)

Transistors - PNP and NPN transistors - DC Characteristics of CE and CB configuration-Hybrid Parameters-Functions of Transistor as an amplifier and oscillator – FET Characteristics - FET amplifier

UNIT III : Operational Amplifier (15 Pds.)

The basic operational amplifier– Inverting and Non inverting operational Amplifier – Differential operational amplifier- CMRR-Basic uses of operational amplifier as sign and scale changer and phase shifter - Adder – Subtractor – comparator – Differentiator.

UNITIV: Opto-Electronic Devices LED (15 Pds.)

Radiation transition - Emission spectra – Luminescent efficiency - Method of Excitation-Visible LED - Materials for LED - LED configuration and performance- Photo conduction –Photo diode - Photo transistor - electronic watches - seven segment display -LCD.

UNITV: Lasers (15 Pds.)

Laser and Maser - Basic concepts of stimulated emission –Population inversion and Meta stable state-He-Ne laser-Ruby laser - Ammonia Maser - production – Advantages.

Books for Study:

1. Jacob Millman, Micorelectronics, McGraw Hill publications, New Delhi, 1985.
2. Theraja B.L., The fundamentals of solid state physics, Sultan Chand& Co., Delhi, 2002.
3. Mithal G.K. and Vanvasi, Pulse and Digital electronics, Khanna publication, New Delhi, 2006.

Books for Reference:

1. Ramanan,Function Electronics, TMH, New Delhi, 1994.
2. Millman&Halkias, Electronics devices and Circuits, McGraw-Hill, 1967.
3. Sanjay D Jain, Engineering Physics, Universities Press, Hyderabad, Telengana 2012.

COURSE OUTCOME

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Analyzing the semiconductor material, and types of diodes and its energy gap.	K4
CO2	Know about meaning of transistor and its types, configurations circuits.	K2
CO3	Acquire knowledge about Operational amplifier circuits and its application	K4
CO4	Knowledge about Optoelectronic devices and its working and its uses.	K2
CO5	Knowledge about Laser and Maser and types of Laser working.	K2

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course							Hours	Credits
IV	24UCS4A6		APPLIED PHYSICS-II							5	4
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	2	3	2	3	2	2	2	2	2.2
CO-2	2	2	3	2	2	3	3	2	1	2	2.2
CO-3	2	2	2	3	3	2	2	3	2	2	2.3
CO-4	3	2	2	3	2	3	2	1	3	2	2.3
CO-5	3	2	3	2	3	2	1	2	2	3	2.3
Mean Overall Score											2.26 High

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NON-MAJOR ELECTIVE II – INTERNET AND E-COMMERCE

Semester : IV **Max. Marks :75**

Course Code :24UCS4N2A **Credit :2**

Total Periods : 30 **Exam Hrs. : 3**

OBJECTIVE:

1. Discuss fundamentals of E-Commerce, types and applications.
2. Evaluate the role of the major type of information system in a business environment and the relationship to each other.
3. Access the impact of the internet and internet technology on business electronic commission and electronic business.

UNIT I **(6 Periods)**

Introduction: Definition of Electronic Commerce, E-Commerce: Technology and properties, incentives for energy in electronic commerce, needs of E-Commerce, Advantage and Disadvantage, Framework, Impact of E-Commerce on business, E-Commerce models.

UNIT II **(6 Periods)**

Network Infrastructure for E-Commerce: Internet and Internet based E-Commerce – Issues, Problems and properties – Network infrastructure – Network access equipment, bore band telecommunication (ATM, ISDN, FRAME RELAY), Mobile commerce: Introduction, wireless application protocol, WAP technology, Mobile Information Device.

UNIT III **(6 Periods)**

Web security: Security issues on web, importance of firewall, components of firewall, translations security, emerging client server, Security threats, Network Security, Factors to consider in firewall design, limitation of firewall.

UNIT IV **(6 Periods)**

Encryption: Encryption techniques, Symmetric encryption: keys and data encryption standard, triple encryption, secret key encryption, Asymmetric encryption: Public and Private pair key encryption: Digital signature, virtual private network.

UNIT V **(6 Periods)**

Electronic payments: Overview, the SET protocol, Payment gateway, Certificate, Digital tokens, smart card, credit card, magnetic strip card, E-Checks, Credit / Debit card-based EPS, online banking. EDI applications in business, E-Commerce law, forms of agreement, Govt.Policies and agenda.

TEXT BOOK

1. Ravi Kalakota, Andrew Winston, “Frontiers of Electronic Commerce”, Addison Wesley.

REFERENCE BOOKS

1. Peta Lobsin, John Vacca, “Electronic Commerce”, New Age International.
2. Goel, Ritendra “E-Commerce”, New Age International.

3. Laudon, “E-Commerce: Business, Technology, Society”, Pearson Education.
4. Bajai and Nag, “E-Commerce the cutting edge of Business”, TMH Turbon, “Electronic Commerce 2004: A Managerial Perspective”, Pearson Education.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of technologies used in the field of management information system.	**K2**
CO2	Understand the processes of developing and implementing information system.	**K2**
CO3	Be aware of the ethical, social and security issues of information system.	**K3**
CO4	Develop an understanding of how various information system work together to accomplish the information objectives of an organization.	**K4**
CO5	Understand the role of information system in organizations, the strategic management processes, and the implications for the management and learn about the importance of managing organizational change associated with information system implementation.	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course				Hours			Credits
IV	24UCS4N2A		INTERNET AND E-COMMERCE				2			2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean scores of Cos
CO-1	2	2	3	3	2	2	2	2	3	2	2.3
CO-2	3	2	2	3	2	3	2	3	3	2	2.5
CO-3	3	3	2	3	3	2	3	2	3	2	2.6
CO-4	3	3	3	3	2	3	2	2	3	2	2.6
CO-5	2	3	1	3	3	2	3	2	3	3	2.5
Mean Overall Score											2.5 High

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NON MAJOR ELECTIVE II - WORKING PRINCIPLES OF INTERNET

Semester : IV **Max. Marks :75**

Course Code :24UCS4N2B **Credit : 2**

Total Periods : 30 **Exam Hrs. : 3**

Objective : To understand the working Principles of Internet

UNIT I **(6 Periods)**

What is Internet ? The Internet's underlying Architecture

UNIT II **(6 Periods)**

Connecting to the Internet – Communicating on the Internet

UNIT III **(6 Periods)**

How the World Wide Web works - Common Internet tools?

UNIT IV **(6 Periods)**

Multimedia on the Internet – Intranet and Shopping on the Internet

UNIT V **(6 Periods)**

Safeguarding the Internet

TEXT BOOK:

1. "How the Internet Works", Preston Gralla, Pearson Education, Eighth Edition, 2006.

REFERENCE BOOK:

1. Internet for Everyone, Alexis Leon, S. Chand (G/L) & Company Ltd; Second Edition 2012.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Distinguish, identify and relate between the principal layers of a complex communication system	**K2**
CO2	Have the skills required to install, administer and manage a Local Area Network (LAN) and be able to network that LAN to other network segments over wide area links	**K3**
CO3	Communicate effectively with associates in written, oral or schematic form	**K3**
CO4	Know and be able to apply basic management principles such as project and time management, break-even analysis, planning and control	**K3**
CO5	Schedule or supervise telecommunications projects and follow up with written reports in accordance with established formats and procedures	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
IV	24UCS4N2B	WORKING PRINCIPLES OF INTERNET								2	2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	2	3	2	2	2	2	3	2	2.2
CO-2	3	2	2	1	2	2	2	3	2	2	2.1
CO-3	2	2	3	2	3	2	3	2	2	2	2.3
CO-4	3	2	3	2	2	3	2	2	2	2	2.3
CO-5	2	2	1	2	3	2	3	2	2	3	2.2
Mean Overall Score											2.22 High

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NON-MAJOR ELECTIVE II –HTML SCRIPTING LANGUAGES

Semester : IV **Max. Marks :75**

Course Code :24UCS4N2C **Credit : 2**

Total Periods : 30 **Exam Hrs. : 3**

Objective: To Personalize web pages using text formatting, graphics, audio, and video elements.

UNIT I **(6 Periods)**

HTML Overview- HTML Basic Tag-Html List -HTML image- HTML Link-HTML Image map-Image map with link –types of Link

UNIT II **(6 Periods)**

HTML frameset -HTML form -HTML meta HTML Script-Types of Scripts

UNIT III **(6 Periods)**

CSS: CSS introduction - CSS Syntax- CSS id class - CSS styling- CSS background- CSS text- CSS font- CSS Links CSS table CSS List CSS Box model CSS border outline Margin- CSS padding.

UNIT IV **(6 Periods)**

HTML INPUT TAGS-INPUT button Textbox Option button –dropdown-submit button –reset button –div-span- design a login form.

UNIT V **(6 Periods)**

Creating Web Pages-Publishing Web pages -website forum –HTML with Scripting-JavaScript-VBScript-Make dynamic page

TEXT BOOK:

1. HTML 5 in simple steps-Kogent Learning Solutions Inc,Dreamtech press.
2. A beginner's guide to HTML, NCSA 14th May 2003
3. Creating web page and web site,Murray,Tom/Lynchburg

REFERENCE BOOK:

1. HTML, XHTML, and CSS Bible,5 ed, Steven M.Schafer,Wiley India
2. Beginning HTML, XHTML, and CSS and JavaScript

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To Design static web pages using HTML and CSS Using internet technologies.	K2
CO2	To Create a basic website using HTML and Cascading Style Sheets.	K3
CO3	To apply different event handling mechanisms.	K3
CO4	To design front end web page and connect to the back end databases.	K3
CO5	To design and implement dynamic web pages.	K4

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
IV	24UCS4N2C	HTML SCRIPTING LANGUAGES								2	2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	3	2	3	2	2	2	2	3	2	2.3
CO-2	3	2	2	2	2	2	2	3	2	2	2.2
CO-3	3	2	3	2	3	2	3	2	2	2	2.4
CO-4	2	3	3	2	1	3	2	2	2	2	2.2
CO-5	3	2	3	2	3	2	3	2	2	3	2.5
Mean Overall Score											2.32 High

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CORE COURSE - IX – PYTHON PROGRAMMING

Semester : V **Max. Marks : 75** **Course Code :24UCS5C9** **Credit : 5**

Total Periods : 75 **Exam Hrs. : 3**

OBJECTIVES:

1. Understand Python syntax and basic programming concepts.
2. Implement data structures and algorithms in Python.
3. Utilize Python libraries for various applications.
4. Develop proficiency in object-oriented programming with Python.
5. Apply Python for solving real-world problems and projects.

UNIT - I: **(15 Periods)**

Introduction to Python: Features of Python - How to Run Python - Identifiers - Reserved Keywords - Variables - Comments in Python - Indentation in Python - Multi-Line Statements - Multiple Statement Group (Suite) - Quotes in Python - Input, Output and Import Functions - Operators. Data Types and Operations: Numbers – Strings – List – Tuple – Set – Dictionary – Data type conversion.

UNIT - II: **(12 Periods)**

Flow Control: Decision Making – Loops – Nested Loops – Types of Loops. Functions: Function Definition – Function Calling - Function Arguments - Recursive Functions - Function with more than one return value.

UNIT - III: **(18 Periods)**

Modules and Packages: Built-in Modules - Creating Modules – import Statement - Locating Modules - Namespaces and Scope - The dir() function - The reload() function - Packages in Python - Date and Time Modules. File Handling- Directories in Python.

UNIT - IV: **(12 Periods)**

Object-Oriented Programming: Class Definition - Creating Objects - Built- in Attribute Methods - Built-in Class Attributes- Destructors in Python – Encapsulation - Data Hiding – Inheritance – Method Overriding- Polymorphism.

UNIT - V: **(18 Periods)**

Exception Handling: Built-in Exceptions-Handling Exceptions- Exception with Arguments - Raising Exception - User-defined Exception - Assertions in Python. Regular Expressions: The match() function - The search() function - Search and Replace – Regular Expression Modifiers: Option Flags- Regular Expression Patterns- Character Classes-Special Character Classes - Repetition Cases - findall() method - compile() method.

TEXT BOOK:

2. Mark Summerfield. ― Programming in Python 3: A Complete introduction to the Python Language, Addison-Wesley Professional, 2009.

REFERENCE BOOK:

Martin C. Brown, ―PYTHON: The Complete Reference‖, McGraw- Hill, 2001.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To recall and understand the features of python programming language	**K2**
CO2	To illustrate various programming mechanism used in python	**K3**
CO3	To apply various language construct to write simple programs in python	**K3**
CO4	examine the application of object oriented concept in python	**K4**
CO5	distinguish the various constructs used in python.	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course							Hours	Credits
V	24UCS5C5		PYTHON PROGRAMMING							5	5
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	3	2	3	1	2	2	2	2	2.1
CO-2	2	2	2	3	2	2	2	1	3	2	2.1
CO-3	2	2	1	3	1	3	3	1	2	3	2.1
CO-4	2	2	1	3	2	2	2	2	3	2	2.1
CO-5	2	1	2	2	2	2	2	3	2	3	2.1
Mean Overall Score											2.1 High

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CORE COURSE – X PRACTICAL – PYTHON PROGRAMMING LAB

Semester : V **Max. Marks :60**

Course Code :24UCS5C10P **Credit : 4**

Total Periods : 90 **Exam Hrs. : 3**

OBJECTIVES:

1. To write, test, and debug simple Python programs.
2. To implement Python programs with conditionals and loops.
3. To represent compound data using Python lists, tuples, and dictionaries.

Program List:

1. Flow controls, Functions and String Manipulation **(9 Periods)**
2. Operations on Tuples and Lists **(9 Periods)**
3. Operation on sets **(9 Periods)**
4. Operations on Dictionary **(9 Periods)**
5. Simple OOP– Constructors – create a class for representing a car **(9 Periods)**
6. Method Overloading – create classes for vehicle and Bus and demonstrate method overloading **(9 Periods)**
7. Files – Reading and Writing – perform the basic operation of reading and writing with student file **(9 Periods)**
8. Regular Expressions **(9 Periods)**
9. Modules & Packages **(9 Periods)**
10. Exception Handling **(9 Periods)**

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Write simple programs using control structures, functions and strings	**K3**
CO2	Develop programs using tuples, lists, sets and dictionary	**K4**
CO3	Write simple programs using Constructors, Method overloading and inheritance	**K3**
CO4	Develop programs using files and regular expressions	**K4**
CO5	Write simple programs using packages and exception handling	**K3**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course							Hours	Credits
V	24UCS5C5P	PYTHON PROGRAMMING LAB							6	4
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean scores of Cos
CO-1	2	2	3	3	3	2	2	1	3	3	2.4
CO-2	2	2	3	3	2	2	2	3	3	2	2.4
CO-3	2	2	3	1	2	3	2	2	3	3	2.3
CO-4	2	1	2	3	2	2	2	1	3	3	2.1
CO-5	3	3	2	1	2	1	2	3	2	3	2.2
Mean Overall Score											2.28 High

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CORE COURSE XI - OPERATING SYSTEM

Semester : V **Max. Marks : 75**

Course Code : 24UCS5C11 **Credit : 5**

Total Periods : 75 **Exam Hrs. : 3**

Objectives:

1. Students will learn how Operating System is Important for Computer System.
2. To make aware of different types of Operating System and their services.
3. To learn different process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.
4. To know virtual memory concepts.
5. To learn Unix Operating System.

UNIT I **(14 Periods)**

Introduction –What is an Operating System? – Operating System Software – Brief History of Memory Hardware – Types of Operating System – Brief History of Operating System Development - Operating System Services - System Calls – Program Calls.

UNIT II **(15 Periods)**

MEMORY MANAGEMENT: Single User Contiguous Scheme – Fixed Partition – Dynamic Partitions – Best Fit Versus First Fit Allocation – Deallocation – RelocatableDynamic Partitions – Paged Memory Allocation - Demand Paging – Page Replacement Policies and Concepts – Segmented Memory Allocation – Segmented / Demand Paged Memory Allocation – Virtual Memory – Cache Memory.

UNIT III **(18 Periods)**

PROCESS MANAGEMENT: Process Scheduler – Process Scheduling Policies – Process Scheduling Algorithms – DEADLOCK – Seven Cases of Deadlock – Conditions for Deadlock – Modeling Deadlock – Strategies for Handling Deadlocks – Starvation.

UNITIV **(16 Periods)**

DEVICE MANAGEMENT: Types of Devices – Sequential Access Storage Media – Direct Access Storage Devices – FILE MANAGEMENT: The File Manager – Interactive with the File Manager – File Organization – Physical Storage Allocation – Access Methods.

UNIT V **(12 Periods)**

UNIX Operating System – Overview – History – Design goals – Memory Management – Process Management – Device Management – File Management- User Command Interface.

TEXT BOOKS:

1. Ann Mc Iver Mc Hoes Ida M. Flynn – Understanding Operating Systems – 6th Edition.

REFERENCE BOOK:

1. Abraham Silberschatz, Galvin and Gagne - Operating System Concepts –8th edition -Addison Wiley Publication.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the services provided by the OS and the design of an operating system	**K2**
CO2	Understand the structure and organization of the file system	**K2**
CO3	Understand what a process is and how processes are synchronized and scheduled	**K3**
CO4	Understand the different approaches to memory management	**K4**
CO5	Demonstrate an understanding of different I/O techniques in operating system	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course							Hours	Credits
V	24UCS5C6		OPERATING SYSTEM							5	5
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	3	2	3	2	2	2	2	2	2.2
CO-2	2	2	3	3	2	2	2	1	3	2	2.2
CO-3	2	2	2	3	1	3	3	1	2	3	2.2
CO-4	2	2	2	3	2	2	2	2	3	2	2.2
CO-5	2	1	2	3	2	2	2	3	2	3	2.2
Mean Overall Score											2.2 High

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CORE COURSE XII – DATA STRUCTURE AND ALGORITHM

Semester : V **Max. Marks : 75**

Course Code :24UCS5C12 **Credit :5**

Total Periods : 75 **Exam Hrs .: 3**

Objectives:

1. To provide the knowledge of basic data structures and their implementations.
2. To understand importance of data structures in context of writing efficient programs.
3. To develop skills to apply appropriate data structures in problem solving.

UNIT I (15 Periods)

Arrays and Sequential Representations – Ordered Lists – Stacks and Queues – Evaluation of Expressions – Multiple Stacks and Queues – Singly Linked List – Linked Stacks and Queues – Polynomial Addition.

UNIT II (15 Periods)

Trees – Binary Tree Representations – Tree Traversal – Threaded Binary Trees – Binary Tree Representation of Trees – Graphs and Representations – Traversals, Connected Components and Spanning Trees – Shortest Paths and Transitive Closure – Activity Networks – Topological Sort and Critical Paths.

UNIT III (15 Periods)

Algorithms – Priority Queues - Heaps – Heap Sort – Merge Sort – Quick Sort – Binary Search – Finding the Maximum and Minimum.

UNIT IV (15 Periods)

Greedy Method: The General Method – Optimal Storage on Tapes – Knapsack Problem – Job Sequencing with Deadlines – Optimal Merge Patterns.

UNIT V (15 Periods)

Back tracking: The General Method – The 8-Queens Problem – Sum of Subsets – Graph Colouring.

TEXT BOOKS:

1. Fundamentals of Data Structure – Ellis Horowiz, SartajSahni, Galgotia Publications, 2008.
2. Computer Algorithms – Ellis Horowiz, SartajSahni and Sanguthevar Rajasekaran, University Press, 2008.

REFERENCE BOOK:

Data Structures – Seymour Lipschutz, Tata Mcgraw Hill, Schaum's Outline Series 2014.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Have fundamental knowledge on data structures	**K1**
CO2	Perform various operations on stack	**K3**
CO3	Represent queue and its structures	**K3**
CO4	Work with Trees and Tree Traversals	**K4**
CO5	Work with various standard algorithms	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course							Hours	Credits
V	24UCS5C7		DATA STRUCTURE AND ALGORITHM							5	5
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	3	2	3	2	2	2	3	2	2.3
CO-2	2	2	3	3	2	2	2	3	3	2	2.4
CO-3	2	1	3	3	1	3	1	1	3	3	2.1
CO-4	2	3	2	3	2	2	2	1	3	2	2.2
CO-5	2	1	2	3	2	2	2	3	2	3	2.2
Mean Overall Score											2.24 High

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MAJOR BASED ELECTIVE I – COMPUTER ARCHITECTURE

Semester : V **Max. Marks : 75**

Course Code :24UCS5MBE1A **Credit :3**

Total Periods : 60 **Exam Hrs. :3**

Objective:

1. To understand the structure, function and characteristics of computer systems.
2. To understand the design of the various functional units and components of computers.
3. To identify the elements of modern instructions sets and their impact on processor design.
4. To explain the function of each element of a memory hierarchy.
5. To identify and compare different methods for computer I/O.

UNIT1 **(12 Periods)**

Computer Evolution: Pentium and Power PC Evolution. Computer System: Components–Function–Interconnection Structures–Bus Interconnection–Basics of PCI Bus. Memory: Characteristics–Hierarchy–Cache Memory–Principles–Cache Design–Locality of Reference.

UNIT II **(12 Periods)**

Main Memory: Static RAM – Dynamic RAM – Types of ROM–Memory Chip Organization – Types of DRAM. External Memory: Magnetic Disk – Basics of RAID–Optical Memory – Magnetic Tapes.

UNIT III **(12 Periods)**

Input/Output: External Devices – I/O Module – Programmed I/O –Interrupt Driven I/O–DMA–I/O Channels & Processors. Computer Arithmetic: ALU – Integer Representation and Arithmetic – Floating Point Representation and Arithmetic. Instruction Set: Characteristics – Operand Types–Operation Types–Addressing Modes– Instruction Formats – Pentium and Power PC Operands, Operations, Addressing Modes (Simple Examples).

UNIT IV **(12 Periods)**

CPU: Organization of Processors and Registers – Instruction Cycle – Instruction Pipe lining – Pentium Processor. RISC: Characteristics – Large Register File – Register Optimization – Architecture – RISC Vs CISC Characteristics – Pipelining.

UNIT V **(12 Periods)**

Control Unit: Micro – Operations – Control of Processors – Hard wired Implementation – Micro Programmed Control Concepts – Micro instruction Sequencing –General Micro Instruction Execution.

TEXT BOOK:

1. W. Stallings,2003, Computer Organization and Architecture, 6th Edition - PHI, New Delhi.

REFERENCE BOOKS:

1. C.Hamacher, Z. VranesicS.Zaky,2002, Computer Organization, 5th Edition, McGraw Hill.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Formulate the design process and principles	**K1**
CO2	Assimilate the graphics and their transformations	**K2**
CO3	Generate primitives, interactive graphics and raster graphics	**K3**
CO4	Work with the concepts of Graphic packages and Geometric models	**K3**
CO5	Create applications for interactive multimedia tools	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
V	24UCS5MBE1A	COMPUTER ARCHITECTURE								4	3
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	2	3	3	2	2	1	2	3	2.2
CO-2	2	2	2	3	2	2	2	2	3	2	2.2
CO-3	3	2	2	1	2	3	2	2	3	3	2.3
CO-4	2	2	3	3	2	2	2	1	2	3	2.2
CO-5	3	2	2	3	2	1	2	3	2	3	2.3
Mean Overall Score											2.24 High

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MAJOR BASED ELECTIVE I – SOFTWARE ENGINEERING

Semester : V **Max. Marks: 75**

Course Code : 24UCS5MBE1B **Credit : 3**

Total Periods : 60 **Exam Hrs. : 3**

Objective:

1. To provide knowledge of the various phases of software engineering process.
2. A general understanding of software process models such as the waterfall and evolutionary models.
3. Understanding of software requirements and the SRS documents.
4. Understanding of the role of project management including planning, scheduling, risk management, etc.
5. Describe data models, object models, context models and behavioural models.

UNIT I **(12 Periods)**

INTRODUCTION - The Evolving Role of Software-Software Characteristics -Software Applications -Software Engineering: A Layered Technology -Process, Methods, and Tools -A Generic View of Software Engineering -The Software Process -Software Process Models : The Linear Sequential Model -The Prototyping Model -The RAD Model-The Incremental Model -The Spiral Model

UNIT II **(12 Periods)**

SYSTEM ENGINEERING: Computer-Based Systems -The System Engineering Hierarchy - Product Engineering -Requirements Engineering-System Modeling -ANALYSIS CONCEPTS AND PRINCIPLES: Requirements Analysis-Analysis Principles-Software Prototyping –Specification.

UNIT III **(12 Periods)**

ANALYSIS MODELING: The Elements of the Analysis Model-Data Modeling -Functional Modeling and Information Flow - Behavioural Modeling -The Mechanics of Structured Analysis. DESIGN CONCEPTS AND PRINCIPLES: Software Design and Software Engineering -The Design Process - Design Principles -Design Concepts.

UNIT IV **(12 Periods)**

ARCHITECTURAL DESIGN: Software Architecture-Data Design -Analysing Alternative Architectural Designs-Mapping Requirements into a Software Architecture- Transform Mapping-Transaction Mapping. USER INTERFACE DESIGN: The Golden Rules-User Interface Design -Interface Design Activities.

UNIT V **(12 Periods)**

SOFTWARE TESTING TECHNIQUES: Software Testing Fundamentals-Test Case Design-White-Box Testing -Basis Path Testing -Control Structure Testing -Black-Box Testing. SOFTWARE TESTING STRATEGIES: Unit Testing-Integration Testing-Validation Testing-System Testing -The Art of Debugging

TEXT BOOK:

1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, TMH, Fourth Edition, 2014.

REFERENCE BOOK:

1. Software Engineering – Ian Somerville, 9th Edition, Addison Wesley, 2011.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	How to apply the software engineering life cycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment	**K2**
CO2	An ability to work in one or more significant application domains	**K3**
CO3	Work as an individual and as part of a multidisciplinary team to develop and deliver quality software	**K3**
CO4	Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle	**K4**
CO5	Demonstrate an ability to use the techniques and tools necessary for engineering practice	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
V	24UCS5MBE1B	SOFTWARE ENGINEERING								4	3
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	3	3	2	1	3	2	2	2	2	3	2.3
CO-2	2	3	2	3	2	3	2	3	3	2	2.5
CO-3	3	2	3	1	2	3	2	3	3	3	2.5
CO-4	2	3	3	3	2	2	2	2	1	2	2.2
CO-5	3	3	2	3	2	3	2	3	1	3	2.5
Mean Overall Score											2.4 High

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MAJOR BASED ELECTIVE I – CYBER SECURITY

Semester : V **Max. Marks : 75**

Course Code : 24UCS5MBE1C **Credit : 3**

Total Periods : 60 **Exam Hrs. : 3**

COURSE OBJECTIVES:

1. To introduce the basic concepts of cyber security
2. To acquire knowledge on cyber threats and attacks
3. To become aware of significant security technologies and tools
4. Practice with an expertise in academics to design and implement security solutions.
5. Understand key terms and concepts in Cryptography, Governance and Compliance.

UNIT – I **(12 Periods)**

Components of Information System - Software Development Life Cycle –Security- Software Development Life Cycle - Security Professionals and the Organisation - Communicates of Interest.

UNIT – II **(12 Periods)**

Introduction - Business Need First - Threats - Attacks - Secure Software- Development.

UNIT – III **(12 Periods)**

Introduction - Access Control – Firewall - Protecting Remote Connections - Intrusion Detection and Prevention System – Honeypots, Honey nets and Padded Cell - System Scanning and Analysis Tools - Biometric Access Control

UNIT – IV **(12 Periods)**

Foundation of Cryptology - Cipher Methods – Cryptographic Algorithms – Cryptographic Tools – Protocols for Communication - Attacks on cryptosystems

UNIT – V **(12 Periods)**

Introduction – An over view of Risk Management – Risk Identification – Risk Assessment – Risk Control Strategies – Selecting a Risk Control Strategy – Risk management Discussion Points - Recommended Risk Control Practices.

UNIT – VI (For Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

TEXTBOOK:

1. Michael E. Whitman, Herbert J. Mattord," Principles of Information Security", CENGAGE Learning, 4th Edition.

REFERENCE BOOKS:

1. Principles of Information Security By Michael E. Whitman and Herbert J. Mattord.

2. William Stallings," Cryptography and Network Security – Principles and Practice", Pearson Education, 7th Edition.

COURSE OUTCOMES:

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts, need, approaches, principles and components of security.	**K2**
CO2	Explain the various cyber threats and attacks.	**K2**
CO3	Describe the various Security Technologies and Tools.	**K3**
CO4	Explain the basic principles of cryptography and algorithms.	**K3**
CO5	Examine the various protocols for secure communication.	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
V	24UCS5MBE1C	CYBER SECURITY								4	3
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	3	3	2	1	2	2	2	2	2	3	2.2
CO-2	2	3	2	2	2	3	2	3	2	2	2.3
CO-3	3	2	2	1	2	2	2	3	2	3	2.2
CO-4	2	3	3	3	2	2	2	2	1	2	2.2
CO-5	3	2	2	3	2	3	2	3	2	2	2.4
Mean Overall Score											2.26 High

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SKILL BASED ELECTIVE I – INDESIGN

Semester : V **Max. Marks : 75**

Course Code : 24UCS5SBE1A **Credit : 2**

Total Periods : 45 **Exam Hrs. : 3**

Objective: To inculcate knowledge on Programming and Project Development using In design.

UNIT I **(9 Periods)**

Workspace - Page Setup – Library – Book – Tools – Palettes – Styles - Rotating & Skewing - Create Outlines - Special Characters - Fitting Options – Transparency - Path Finder – Layers - Compound Paths - Paths.

UNIT II **(9 Periods)**

Text Frame Options – Threading - Type on Path – Hyphenation - Story Editor, Introduction to Graphics Options - Master Pages - Indents & Tabs.

UNIT III **(9 Periods)**

Text Wrap - Numbering & Sections - Table Options - Stroke Color& Gradient Options - Swatches.

UNIT IV **(9 Periods)**

Guides - Margin Columns - Printing Issues - Placing Videos & Sounds - Buttons and Hyperlinks - Indexing & Tables of Contents - Data Merge – Footnotes – Glyphs – Interactive - Page Maker Toolbar.

UNIT V **(9 Periods)**

Ask the student to do a PDF presentation with hyperlinks on a product and conduct the test.

TEXT BOOK:

1. In design one – to – one, McClelland, O'Reilly, 2006.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe what Adobe InDesign is and how it can be used	**K2**
CO2	Demonstrate creating and viewing documents	**K2**
CO3	Navigate their workspace	**K3**
CO4	Demonstrate page creation and working with type	**K4**
CO5	Demonstrate working with graphics and formatting objects	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
V	24UCS5SBE1A	INDESIGN								3	2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	2	1	2	2	2	2	2	3	2.0
CO-2	2	1	2	3	2	2	2	2	2	2	2.0
CO-3	2	2	3	3	2	2	2	2	2	2	2.2
CO-4	3	3	2	2	2	2	2	2	2	2	2.2
CO-5	2	1	2	2	3	2	2	2	2	2	2.0
Mean Overall Score											2.08 High

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SKILL BASED ELECTIVE I – COREL DRAW

Semester : V **Max. Marks : 75**

Course Code : 24UCS5SBE1B **Credit : 2**

Total Periods : 45 **Exam Hrs. : 3**

Objective: To inculcate knowledge on Programming and Project Development using Corel Draw.

UNIT I **(9 Periods)**

CorelDRAW Basics

UNIT II **(9 Periods)**

Drawing and Selecting

UNIT III **(9 Periods)**

Working with Text

UNIT IV **(9 Periods)**

Working with Images

UNIT V **(9 Periods)**

Page Layout and Background

TEXT BOOK:

1. DTP Course Kit, Vikas Gupta, Dreamtech Press, 2009.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Various page setup concepts	**K2**
CO2	Use of various tools	**K3**
CO3	Set up drawing pages using ruler, grid and gridlines	**K3**
CO4	Drawing and shaping object, drawing lines, curves, dimension Lines	**K3**
CO5	Work with style & templates	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
V	24UCS5SBE1B	COREL DRAW								3	2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	2	1	2	2	3	2	2	3	2.1
CO-2	2	2	2	3	2	2	2	2	2	2	2.1
CO-3	2	2	3	3	2	3	2	2	2	2	2.3
CO-4	3	2	3	2	2	2	3	2	2	3	2.4
CO-5	2	3	2	1	3	2	3	3	1	2	2.2
Mean Overall Score											2.22 High

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SKILL BASED ELECTIVE I – DESIGNING USING GIMP

Semester	**: V**	**Max. Marks**	**: 75**
Course Code	**: 24UCS5SBE1C**	**Credit**	**: 2**
Total Periods	**: 45**	**Exam Hrs.**	**: 3**

OBJECTIVES:

1. To familiarize students with the GIMP (GNU Image Manipulation Program) interface, tools, and basic functionalities.
2. To teach fundamental image editing techniques such as cropping, resizing, adjusting brightness/contrast, and applying filters.
3. To introduce students to working with layers in GIMP, including creating, organizing, and manipulating layers for complex designs.
4. To explore text tools in GIMP, covering text creation, formatting, and manipulation to integrate typography effectively into designs.
5. To teach students how to use GIMP's color tools for adjusting hues, saturation, and color balance to enhance images and designs.

UNIT I **(9 Periods)**

GIMP Introduction – GIMP History – Features of GIMP – GIMP Versions.

UNIT II **(9 Periods)**

GIMP User Interface – Install GIMP – GIMP vs Photoshop.

UNIT III **(9 Periods)**

GIMP Menus – File Menu – Edit Menu – Select Menu – View Menu – Image Menu – Layers Menu – Colors Menu – Tools Menu – Filter Menu – Basic Tasks – Font options – Brushes – Layer masks – Deselect - Draw line – Draw circle – Draw rectangle – Draw arrow - Rotate Image.

UNIT IV **(9 Periods)**

GIMP Plugins – Photo Editing in GIMP – How to remove Background of an image using GIMP – GIMP cartoon effect.

UNIT V **(9 Periods)**

GIMP Logo making – How to use GIMP online.

Text Book:

Oliver Lecarme and karine Delvare: Book of GIMP, January 2013, 676 PP ISBN:13:978-1-59327-383-5.

Reference Book:

GIMP Documentation Team; GIMP 2.8 Reference Manual: The GNU Image Manipulation program 2018.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Able to demonstrate the comprehension of design-specific knowledge.	**K2**
CO2	Ability to apply it in real time scenarios.	**K3**
CO3	To enable the student to build computer based designs that reflect on their personal and professional growth.	**K3**
CO4	To learn GIMP Cartoon effect.	**K3**
CO5	Work with GIMP Plugins.	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course							Hours	Credits
V	24UCS5SBE1C		DESIGNING USING GIMP							3	2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	3	2	1	2	2	3	3	2	3	2.3
CO-2	2	2	3	3	2	2	2	2	3	3	2.4
CO-3	2	1	3	3	3	3	3	2	3	2	2.5
CO-4	2	3	3	3	2	2	3	3	2	3	2.6
CO-5	3	2	2	2	3	3	3	3	2	2	2.5
Mean Overall Score											2.46 High

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CORE COURSE XIII - WEB TECHNOLOGIES

Semester :VI **Max. Marks:75**

Course Code : 24UCS6C13 **Credit : 5**

Total Periods : 90 **Exam Hrs. : 3**

OBJECTIVES:

1. To comprehend the basics of the internet and web terminologies.
2. To introduce scripting language concepts for developing client-side applications.
3. To practice server-side programming features – PHP, JSP.
4. To be familiar with database applications
5. To know the usefulness of web services.

UNIT – I **(18 Periods)**

Introduction to` VBScript - Adding VBScript Code to an HTML Page - VB Script Basics - VBScript Data Types - VBScript Variables -VBScript Constants - VBScript Operators – mathematical-comparison-logical - Using Conditional Statements - Looping ThroughCode - VBScript Procedures – type casting variables - math functions –date functions – string functions –other functions - VBScript CodingConventions - Dictionary Object in VBScript - Err Object

UNIT – II **(18 Periods)**

Introduction to Javascript – Advantages of Javascript – Javascript syntax - Data type –Variable - Array – Operator & Expression – Looping – control structures - Constructor Function – user defined function Dialog Box.

UNIT – III **(18 Periods)**

Javascript document object model – Introduction – Object in HTML – Event Handling – Window object – Document object – Browser object – Form object – Navigator object – Screen object – Build in object – User defined object – Cookies.

UNIT –IV **(18 Periods)**

ASP.NET Language Structure – Page Structure – Page event , Properties & Compiler Directives . HTML server controls – Anchor, Tables, Forms, Files . Basic Web server Controls – Label, Text box, Button, Image Links, Check & radio Button, Hyperlink, Data List Web Server Controls – Check box list. Radio button list, Drop down list, List box, Data grid, Repeater.

UNIT -V: **(18 Periods)**

Request and Response Objects, Cookies, Working with Data – OLEDB connection class, command class, transaction class, data adaptor class, data set class. Advanced issues – email, Application issues, working with IIS and page Directives, error handling. Security – Authentication, IP Address, Secure by SSL & Client Certificates.

TEXT BOOK:

1. I.Bayross, 2000, Web Enable Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI, BPB Publications.
2. A.Russell Jones, Mastering Active Server Pages 3, BPB Publications.

REFERENCE BOOKS

1. HathleenKalata, Internet Programming with VBScript and JavaScript, Thomson Learning
2. Mike McGrath, XML Harness the Power of XML in easy steps, Dreamtech Publications

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Introduce the creation of VB Scripts	K2
CO2	Describe the importance of functions in java scripts	K2
CO3	Describe the importance of java script in document and Object	K3
CO4	Implement of Web server Controls	K4
CO5	Accessing the Cookies and Security	K4

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
VI	24UCS6C8	WEB TECHNOLOGIES								6	5
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	3	3	2	1	2	2	2	2	2	3	2.2
CO-2	2	3	2	2	2	3	2	3	2	2	2.3
CO-3	3	2	2	1	2	2	2	3	2	3	2.2
CO-4	2	3	3	3	2	2	2	2	1	2	2.2
CO-5	3	2	2	3	2	3	2	3	2	2	2.4
Mean Overall Score											2.26 High

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CORE COURSE – XIV PRACTICAL - WEB TECHNOLOGIES LAB

Semester : VI **Max. Marks: 60**

Course Code : 24UCS6C14P **Credit : 4**

Total Periods : 90 **Exam Hrs. : 3**

OBJECTIVES:

1. Design and develop static and dynamic web pages.
2. Familiarize with Client-Side Programming, Server-Side Programming, Active server Pages.
3. Learn Database Connectivity to web applications.

VB SCRIPT & JAVASCRIPT

1. Write a program outputs the squares, roots, cubes and complements of integers between 1 and 100. **(6 Periods)**

2.Create a calculator. **(6 Periods)**

3. Write a script to Sort numbers and strings **(6 Periods)**

4. Create a program to generate a hit counter **(6 Periods)**

5. Create a program to verify whether email address provided by user is valid or invalid. **(6 Periods)**

6. Write a program to scroll the text on status bar. **(6 Periods)**

7. The form consists of two multiple choice list and one single choice list **(12 Periods)**

a. the first multiple choice list displays the major dishes available.

b. the second Multiple choice list display the stocks available.

c. The single choice list displays the miscellaneous (Milkshakes, soft drinks, softy available etc.)

8. Write a script to create a digital clock. **(6 Periods)**

ASP

1.Create a login form, to expire, if the user does not type the password within 100seconds. **(6 Periods)**

2.Create an employee database and manipulate the records using command object in ASP. **(6 Periods)**

3. Develop an application to illustrate the usage of Request and Response Objects in ASP. **(6 Periods)**

4. Write an ASP program using Request Object to give the exact list of headers sent by the browser to the Web server. (**6 Periods)**

5. Create an Active Server Page to display the records one by one from a student database. The student database should contain roll no, name, marks & total. **(6 Periods)**

6. Design an ASP application that describes books in the Online Bookshop. (Use AD Rotator)

(6 Periods)

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Get hands on experience on various techniques of web development and will be able to design and develop a complete website	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course							Hours	Credits
VI	24UCS6C6P	WEB TECHNOLOGIES LAB							6	4
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean scores of Cos
CO-1	2	3	2	1	2	2	2	2	2	3	2.1
CO-2	2	2	2	2	2	2	2	3	2	2	2.1
CO-3	2	2	3	2	2	3	1	2	2	2	2.1
CO-4	2	3	2	3	2	2	2	2	2	2	2.2
CO-5	2	2	3	2	2	2	2	3	2	2	2.2
Mean Overall Score											2.14 High

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CORE COURSE XV - COMPUTER NETWORKS

Semester : VI **Max. Marks : 75**

Course Code : 24UCS6C15 **Credit : 5**

Total Periods : 75 **Exam Hrs. : 3**

OBJECTIVES:

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

UNIT I **(15 Periods)**

Data Communication – Networks – Protocols and Standard – Line Configuration Topology – Transmission Mode – Categories of Networks – Internet Works.

UNITII **(15 Periods)**

The OSI Model – Functions of the Layers – TCP/IP Protocol Suite: Signals, Analog and Digital Signal – Periodic and Periodic Signals – Analog Signals – Digital Signals – Data Transmission – Data Terminal Equipment – Data Circuit Terminals Equipment – Modems.

UNIT III **(15 Periods)**

Transmission Media: Guided Media – Unguided Media – Transmission Impairment – Media comparison. Multiplexing: FDM-TDM-WDM. Error detection and Correction: Types of Errors – Detection – Vertical Redundancy Check (VRC) – Longitudinal Redundancy Check (LRC) – Cyclic Redundancy Check (CRC) - Check Sum-Error Correction.

UNIT IV **(15 Periods)**

Switching: Circuit Switching – Packet Switching – Message Switching. Networking and Internetworking Devices: Repeaters – Bridges – Routers-Gateways - Routing Algorithms – Distance Vector Routing – Link State Routing – Data Link Control – Line Discipline – Flow Control.

UNIT V **(15 Periods)**

TCP/IP Protocol Suite: Client Server Model – Domain Name System – File Transfer Protocol (FTP) – Simple Mail Transfer Protocols (SMTP) – World Wide Web (www) – Hyper Text Transfer Protocol (HTTP).

TEXT BOOK:

1. "Data Communications and Networks" – Behrouz A. Forouzan, 4th edition, Tata McGraw Hill Edition, 2007.

REFERENCE BOOK:

1. "Computer Networks" – Andrew S. Tanenbaum, 5th edition, 2012.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Independently understand basic computer network technology	**K1**
CO2	Understand and explain Data Communications System and its components	**K2**
CO3	Identify the different types of network topologies and protocols	**K3**
CO4	Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer	**K4**
CO5	Identify the different types of network devices and their functions within a network	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
VI	24UCS6C9	COMPUTER NETWORKS								5	5
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	3	3	2	1	2	2	2	2	2	3	2.2
CO-2	2	3	2	2	2	3	2	3	2	2	2.3
CO-3	2	3	3	2	2	3	2	3	2	3	2.5
CO-4	2	3	3	3	2	2	3	3	2	2	2.5
CO-5	3	2	3	3	2	3	2	3	2	2	2.5
Mean Overall Score											2.4 High

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MAJOR BASED ELECTIVE II –

DIGITAL COMPUTER FUNDAMENTALS & MICRO PROCESSOR

Semester	**:VI**	**Max. Marks**	**: 75**
Course Code	**: 24UCS6MBE2A**	**Credit**	**: 4**
Total Periods	**: 75**	**Exam Hrs.**	**: 3**

Objective:

1. To understand the basic components and architecture of digital computers and microprocessor.
2. To learn how data is represented and processed in digital computers.
3. To Learn about the different types of microprocessor and their applications.
4. To understand the concept of memory and storage in digital computer.
5. To understand the role of microprocessors in computer system and their interactions with other components.

UNIT I **(15 Periods)**

Number Systems and Codes: Binary Number System – Binary to Decimal Conversion – Decimal to Binary Conversion – Octal Numbers – Hexadecimal Numbers – Binary Codes – Logic Gates and Circuits: – AND, OR, NOT, NAND, NOR, Exclusive OR and Exclusive NOR Gates.

UNIT II **(15 Periods)**

Boolean Algebra: Definitions – Fundamentals of Boolean Algebra – Boolean Functions – Minterms and Maxterms – Laws and Theorems of Boolean Algebra – DeMorgan's Theorem - Simplifying Logic Circuits – Sum of Products – AND-OR Networks – Sum of Products and Product of Sums Forms – Karnaugh Maps – Product of Sums Simplification – NAND and NOR Implementation - Don't Care Conditions – Overlapping Groups – Rolling the Map – Eliminating Redundant Groups.

UNIT III **(15 Periods)**

Combinational Logic Circuits: Introduction – Adders – The Half Adder – The Full Adder – Subtractors – BCD Adder – Multiplexers – Demultiplexers – Decoders – Encoders – Sequential Logic Circuits: Flip Flops – RS Flip Flop – Clocked RS Flip Flop – D Flip Flop – JK Flip Flop – T Flip Flop – Master Slave Flip Flop Registers: Counters – Asynchronous or Ripple Counter – Ring Counter – Shift Registers.

UNIT IV **(15 Periods)**

Evolution of Microprocessor – Single chip Microcomputer – Microprocessor Applications –Buses-Memory Addressing capacity and CPU – Microcomputers – Processor Architecture – Intel 8085 – Instruction cycle – Timing Diagram

UNIT V **(15 Periods)**

Instruction Set of Intel 8085 – Instruction and Data Format – Address Modes – Status Flags – Intel 8085 instruction - Programming Microprocessor – Assembly language – Assembler.

TEXT BOOKS:

1. Principles of Digital Electronics, Dr. K. Meena, PHI Learning Private Limited, New Delhi, 2009.
2. Fundamentals of Microprocessors and Microcomputers, Badri Ram, Eighth Edition, DhanpatRai Publications,2012.

REFERENCE BOOKS:

1. Digital Logic Design,M.MorrisMano ,Pearson Education, 2010
2. Microprocessors and Microcontrollers, Senthil Kumar Saravanan, Jeevananthan, Oxford Univ Press, 2010

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Analyzing problems, and designing and implementing algorithmic solutions.	**K2**
CO2	Solving problems properly, achieving an implementation that is correct, effective and efficient	**K3**
CO3	Using computers at user level, including operative systems and programming environments	**K3**
CO4	Knowledge of computer equipment, including both hardware and software	**K4**
CO5	Identifying information needs to solve problems, recovering information and applying it to the resolution	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course							Hours	Credits
VI	24UCS6MBE2A		DIGITAL COMPUTER FUNDAMENTALS & MICRO PROCESSOR							5	4
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	3	2	2	2	2	2	3	2	3	2.3
CO-2	2	2	2	3	2	2	3	3	2	2	2.3
CO-3	2	2	3	3	2	3	2	2	2	2	2.3
CO-4	2	3	2	3	2	2	3	2	3	2	2.4
CO-5	2	3	3	2	3	2	2	3	1	2	2.3
Mean Overall Score											2.32 High

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MAJOR BASED ELECTIVE II–DOT NET CONCEPTS

Semester :VI	**Max. Marks : 75**
Course Code : 24UCS6MBE2B	**Credit : 4**
Total Periods : 75	**Exam Hrs. : 3**

Objectives:

1. To learn about basic features of ASP.NET and its controls.
2. To create an ASP.NET application using standard .NET Controls.
3. To learn about connecting data sources using ADO.NET and managing them.

UNIT I **(15 Periods)**

The ASP.NET Runtime Environment: Introduction to ASP.NET- The AJAX Revolution- ASP.NET of the Future- ASP.NET and IIS: The Web Server Environment- Deploying ASP.NET Applications- ASP.NET Configuration: The ASP.NET Configuration Hierarchy- Managing Configuration Data

UNIT II **(15 Periods)**

HTTP Handlers, Modules, and Routing : Writing HTTP Handlers- Writing HTTP Modules- URL Routing- Anatomy of an ASP.NET Page: Invoking a Page- The Page Class- The Page Life Cycle- ASP.NET Core Server Controls : Generalities of ASP.NET Server Controls- HTML Controls- Web Controls

UNIT III **(15 Periods)**

Working with the Page: Dealing with Errors in ASP.NET Pages- Page Personalization- Page Localization- Adding Resources to Pages- Page Composition and Usability : Page Composition Checklist- Page Usability Checklist.

UNIT IV **(15 Periods)**

ASP.NET Input Forms: Programming with Forms- Validation Controls- Working with Wizards- Data Binding: Foundation of the Data Binding Model – Data-Bound Controls- Data-Binding Expressions- Managing Tables of Data- Data Source Components.

UNIT V **(15 Periods)**

Layers of an Application: A Multitiered Architecture- The Business Layer- The Data Access Layer- ASP.NET Caching: Caching Application Data- Distributed Cache- Caching ASP.NET Pages- ASP.NET Security: Security-Related Controls- Using Forms Authentication

TEXT BOOK

1. Programming Microsoft ASP.NET 4, Dino Esposito, First Edition, 2011.

REFERENCE BOOK:

1. “Professional ASP.NET MVC 5 (WROX)” by Jon Galloway and Brad Wilson, 2014.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the ASP.NET Runtime Environment and ASP.NET page structure.	**K1**
CO2	Design web application with variety of controls	**K2**
CO3	Access the data using inbuilt data access tools	**K3**
CO4	Use Microsoft ADO.NET to access data in web Application & Configure and deploy Web Application	**K4**
CO5	Develop secured web application & understands the ASP.NET security	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
VI	24UCS6MBE2B	DOT NET DCONCEPTS								5	4
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	2	2	2	2	2	3	2	3	2.2
CO-2	2	2	2	3	2	2	2	3	2	2	2.2
CO-3	2	3	3	3	2	3	2	2	2	2	2.4
CO-4	3	3	2	3	2	2	3	2	3	2	2.5
CO-5	2	3	3	2	3	2	2	3	2	2	2.4
Mean Overall Score											2.34 High

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MAJOR BASED ELECTIVE II – BASICS OF IOT

Semester : VI **Max. Marks : 75**

Course Code : 24UCS6MBE2C **Credit : 4**

Total Periods : 75 **Exam Hrs. : 3**

OBJECTIVES:

1. To understand overview of IoT and Internet principles.
2. To learn about the concepts of IoT and various IoT related protocols
3. To analyze various protocols for IoT.
4. To apply data analytics and use embeded code related to IoT.
5. To analyze applications of IoT in real time scenario

UNIT I **(15 Periods)**

The Internet of Things- An Overview- The Flavour of the Internet of Things, The "Internet" of "Things"-The Technology of the Internet of Things - Enchanted Object - Who is Making the Internet of Things? -Design Principles for Connected Devices- Web Thinking for Connected Devices- Small Pieces-Loosely Joined- First-Class Citizens On the Internet-Graceful Degradation and Affordances.

UNIT II **(15 Periods)**

Internet Principles: Internet Communications- An Overview- IP- TCP-The IP Protocol Suite (TCP/IP)-UDP-IP Addresses-DN- Static IP Address Assignment-Dynamic IP Address Assignment-IPv- MAC Addresses- TCP and UDP Ports- An Example: HTTP Ports-Other Common Ports- Application Layer Protocol- HTTP. HTTPS- Encrypted HTTP.

UNIT III **(15 Periods)**

Prototyping Embedded Devices- Electronics- Sensors- Actuators- Scaling Up the Electronics-Embedded Computing Basics-Microcontrollers- System-on-Chips- Choosing Your Platform-Adriano-Developing on the Adriano- Some Notes on the Hardware- Openness- Raspberry Pi- Cases and Extension Boards- Developing on the Raspberry Pi- Some Notes on the Hardware- Openness-Prototyping the Physical.

UNIT IV **(15 Periods)**

Prototyping Online Components: Getting Started with an API- Mashing Up APIs- Scraping-Legalities-Writing a New API- Clockodillo- Security- Implementing the API- Using Curl to Test- Going Further Real-Time Reactions- Polling- Comet- Other Protocols- MQ Telemetry Transport- Extensible Messaging and Presence Protocol- Constrained Application Protocol-Techniques for Writing

UNIT V **(15 Periods)**

Business Models-A Short History of Business Models- Space and Time- From Craft to Mass Production- The Long Tail of the Internet- Learning from History- The Business Model Canvas- Who Is the Business Model For? - Models- Make Thing- Sell Thing- Subscription- Customization-Be a Key

Resource-

TEXT BOOKS:

1. "Designing the Internet of Things" by Adrian McEwen, Hakim Cassimally, WILEY Publisher, 1st Edition, 2014.

REFERENCE BOOKS:

"Rethinking the Internet of Things-A scalable approach to connecting everything", by Francis DaCosta,Apress open publication,2013.

1. "Learning Internet of Things" by Peter Waher, PACKT Publishing-Birmingham-mumbai-2015.
2. "Internet of Things: A Hands on Approach", by ArhdeepBahga and Vijay Madisetti (http://www.internet-of-things-book.com/).

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Gain a comprehensive understanding of what constitutes the Internet of Things (IoT), including its definition, components, and key technologies.	**K2**
CO2	Study various IoT architectures such as client-server, fog computing, and edge computing, and understand their applications and differences.	**K2**
CO3	Familiarize yourself with commonly used IoT communication protocols like MQTT, CoAP, and HTTP(S), and comprehend their suitability for different IoT applications.	**K3**
CO4	Gain knowledge about sensor networks, their types, deployment strategies, and methods for efficient data collection from IoT devices.	**K3**
CO5	Gain practical experience in interacting with IoT devices, setting up simple IoT systems, and using IoT development boards and platforms.	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
VI	24UCS6MBE2C	BASICS OF IOT								5	4
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	2	2	2	2	2	3	2	3	2.2
CO-2	2	2	2	3	2	2	2	3	2	2	2.2
CO-3	2	3	3	3	2	3	2	2	2	2	2.4
CO-4	3	3	2	3	2	2	3	2	3	2	2.5
CO-5	2	3	3	2	3	2	2	3	2	2	2.4
Mean Overall Score											2.34 High

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PROJECT WORK

Semester	**: VI**	**Max. Marks**	**: 60**
Course Code	**: 24UCS6PW**	**Credit**	**: 3**
Total Periods	**: 60**	**Exam Hrs.**	**: 3**

Students to do Mini Project in their respective Colleges. The objective of the Mini Project is to enable the students to work in convenient groups of not more than four members on a project with a Latest Software.

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SKILL BASED ELECTIVE II – DREAM WEAVER

Semester : VI **Max. Marks : 75**

Course Code : 24UCS6SBE2A **Credit : 2**

Total Periods : 45 **Exam Hrs. : 3**

Objective: To inculcate knowledge on Programming and Project Development using Dream Weaver.

UNIT I **(9 Periods)**

Introduction to Dreamweaver CS4 - Working with Dreamweaver Websites.

UNIT II **(9 Periods)**

Working with Web Pages - Working with HTML Tables - Framesets and Frames.

UNIT III **(9 Periods)**

Introduction to Cascading Style Sheets.

UNIT IV **(9 Periods)**

Working with Templates - Working with Flash Contents and HTML Forms.

UNIT V **(9 Periods)**

Working with JavaScript - Finalizing the Site.

TEXT BOOK :

1. Dreamweaver CS4 in Simple Steps, Kogent Learning Solutions Inc, Dreamtech Press, 2010

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the concepts of Dreamweaver	**K2**
CO2	Utilize several Flash tools and tactics	**K3**
CO3	Use critical thinking skills to design and create basic web sites	**K3**
CO4	Use Adobe Dreamweaver and a stand-alone FTP program to upload files to a web server	**K4**
CO5	Use critical thinking skills to design and create a multi-page website	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
VI	24UCS6SBE2A	DREAM WEAVER								3	2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	2	2	2	1	2	2	2	2	2	3	2.0
CO-2	2	2	2	3	2	2	2	2	2	3	2.2
CO-3	2	1	2	2	3	2	2	2	3	2	2.1
CO-4	2	2	3	2	2	2	2	3	2	2	2.2
CO-5	2	2	3	1	3	2	2	1	3	2	2.1
Mean Overall Score											2.12 High

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SKILL BASED ELECTIVE II – ILLUSTRATOR

Semester : VI **Max. Marks : 75**

Course Code : 24UCS6SBE2B **Credit : 2**

Total Periods : 45 **Exam Hrs. : 3**

Objective: To inculcate knowledge on Programming and Project Development using Illustrator.

UNIT I **(9 Periods)**

Introduction to Vector Graphics – Toolbox – Palettes – Opening – Viewing - Saving Documents. Templates – Paths – Selections - Distorting Paths.Organizing Objects – Grouping – Transparency - Blends.

UNIT II **(9 Periods)**

Clipping Masks - Compound Paths – Texts – Flares - Info Palettes – Save - Save for Web - Export Graphs and Pathfinder - Align Symbol Sprayer - Creating Custom Symbols.

UNIT III **(9 Periods)**

Stroke – Fill – Gradient – Options – Swatches - Color Modes – Patterns - Transform – Pencil – Smooth – Eraser – Brushes – Meshes – Opacity - Transparency Modes – Caps – Joins - Dashes Options - Effects Menu – Grid - Rulers and Guides.

UNIT IV **(9 Periods)**

Use of Appearance Palette – Layers – Styles - Printing Options – Web - Pixel Preview Mode - Different File Formats. Slices - Logo Creations - Web Banner Creation and Animation.

UNITV **(9 Periods)**

Industry Tips and Tricks - Creating a Logo – Letter Head - Visiting Card for a Corporate Company.

TEXT BOOK:

1. Multimedia and Web Design, Vikas Gupta, Comdex, 2006.

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamental concepts of Illustrator	**K3**
CO2	Apply critical thinking skills to solve visual problems using Adobe Illustrator CS6	**K3**
CO3	Demonstrate knowledge of Adobe Illustrator by selecting and applying appropriate tools to complete a variety of specific graphic design exercises	**K3**
CO4	Demonstrate knowledge of specific technical issues relative to the of vector files including resolution, prep for internet use, convert to bitmap, and output (print issues)	**K4**
CO5	Demonstrate knowledge of how Adobe Illustrator is used by designers for a variety of production processes including WEB, Multimedia and Print	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code		Title of the Course							Hours	Credits
VI	24UCS6SBE2B		ILLUSTRATOR							3	2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	3	2	3	1	3	2	2	3	2	3	2.4
CO-2	2	3	2	3	2	1	3	2	3	3	2.4
CO-3	2	2	3	2	3	1	2	3	3	3	2.4
CO-4	2	2	3	2	2	2	2	3	2	2	2.2
CO-5	2	2	3	1	3	2	2	1	3	2	2.1
Mean Overall Score											2.3 High

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SKILL BASED ELECTIVE II – 3D ANIMATION

Semester : VI **Max. Marks : 75**

Course Code : 24UCS6SBE2C **Credit : 2**

Total Periods : 45 **Exam Hrs. : 3**

OBJECTIVES:

1. To introduce students to the principles and basics of 3D animation, including key terminology, concepts, and workflow.
2. To teach students how to create and manipulate 3D models using modeling software such as Blender, Maya, or 3ds Max, focusing on techniques for creating characters, objects, and environments.
3. To explore character rigging techniques, including bone systems, IK (Inverse Kinematics), FK (Forward Kinematics), and how to animate characters realistically and expressively.
4. To teach students how to create key frame animations, including timing, spacing, and interpolation techniques to bring 3D models to life.

UNIT I **(9 periods)**

Introduction to 3D Animation: Overview of Animation Principles - History and Evolution of Animation Techniques - Introduction to 3D Animation Software (e.g., Autodesk Maya, Blender) - Basic Navigation and Interface Familiarization

UNIT II **(9 Periods)**

3D Modeling and Texturing: Polygon Modeling Techniques - Sculpting Basics (if applicable) - UV Mapping and Texturing Fundamentals - Introduction to Material Shaders

UNIT III **(9 Periods)**

Rigging and Character Animation: Principles of Rigging and Character Setup - Skinning Techniques - Key Frame Animation and Timing - Character Posing and Facial Animation Basics

UNIT IV **(9 Periods)**

Lighting, Rendering, and Compositing: Fundamentals of Lighting in 3D - Rendering Techniques and Settings - Introduction to Render Engines (e.g., Arnold, Render Man) - Compositing Basics and Layering Techniques

UNIT V **(9 Periods)**

Special Effects and Dynamics: Particle Systems and Dynamics Simulations - Fluid Simulation Basics (if time allows) - Cloth and Hair Dynamics - Integration of Effects with Animation Scenes

Textbooks:

1. "Introducing Autodesk Maya 2022" by Dariush Derakhshani
2. "Blender Foundations: The Essential Guide to Learning Blender 2.8" by Roland Hess
3. "Digital Lighting & Rendering" by Jeremy Birn

Reference Books:

1. "The Animator's Survival Kit" by Richard Williams
2. "Character Animation Crash Course!" by Eric Goldberg
3. "Stop Staring: Facial Modeling and Animation Done Right" by Jason Osipa

COURSE OUTCOMES:

On completion of the course students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Mastery of software tools and techniques essential for creating professional-quality animations.	**K3**
CO2	Ability to create animations that effectively communicate character emotion, physical movement, and narrative intention.	**K3**
CO3	Capacity to innovate and adapt animation techniques to meet project requirements and artistic goals.	**K3**
CO4	Creation of a professional portfolio suitable for job applications or further education in animation-related fields.	**K4**
CO5	Preparation to contribute effectively to animation projects within professional environments, adhering to deadlines and collaborative workflows.	**K4**

Relationship matrix for Course outcomes, Programme outcomes / Programme specific outcomes

MAPPING WITH PROGRAMME OUTCOMES:

Semester	Course Code	Title of the Course								Hours	Credits
VI	24UCS6SBE2C	3D ANIMATION								3	2
Course outcomes	Programme outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
CO-1	3	2	3	1	2	2	2	2	2	3	2.2
CO-2	2	3	2	2	2	1	3	2	3	2	2.2
CO-3	3	2	2	1	3	1	2	3	3	3	2.3
CO-4	2	2	3	2	3	2	2	3	3	2	2.4
CO-5	3	2	3	2	3	2	2	1	3	2	2.3
Mean Overall Score											2.28 High

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