THIRUVALLUVAR UNIVERSITY
VELLORE
MASTER OF COMPUTER APPLICATION
CBCS PATTERN
(With effect from 2022 - 2023)

I. Programme Objectives

PO1: To prepare students for a career in computer application that requires a strong academic foundation and a wide range of perspectives.

PO2: To design and implement computer applications in the important areas, as well as gain professional competency in domain concerned.

PO3: To train the individuals to deal with issues on integration and configuration linked with systems and applications.

PO4: To meet the ever-increasing demands of the IT sector, a strong theoretical foundation in computers as well as practical skills is provided.

PO5: To guide the students for better knowledge of computer applications and develop programming skills coupled with managerial skills in order to meet the emerging IT industry demands.

II. Programme Educational Objectives (PEOs)

PEO1: To enlighten the students as skilled professionals, innovators, or entrepreneurs in the technology development and deployment.

PEO2: To provide a concrete foundation in both theoretical and application relevant to recent developments in the IT sector.

PEO3: To acquire the ability to develop solutions for real-time challenges in various disciplines, including technological, managerial, economic, and social considerations.

PEO4: To achieve success as educators by instilling a passion for studying and instructing and seeking further education and research in computerscience and applications and/or other areas connected to it.

PEO5: To recognize the need for and develop the ability to engage in continuous learning as computing professionals.

III.   Programme Outcomes (POs)

PO1 - Computational Knowledge: Having ability to apply computing knowledge in a wide range of applications.

PO2 - Problem Analysis: Having ability to identify, formulate, conduct research in the relevant literature, and solve complex problems using fundamental principles from mathematics, computing sciences, and other relevant disciplines.

PO3 - Design and Development of Solutions: Having ability todesign, conduct experiments and evaluate solutions of critical problems to meet the user requirements.

PO4 - Conduct Investigations of Complex Computing Problems: Having ability to use research-based knowledge and research procedures, such as experiment design, data analysis and interpretation, and information synthesis, to arrive at sound conclusions.

PO5 - Modern Tool Usage: Having ability **to c**hoose, adapt, and apply appropriate approaches, resources, and current computing tools to complicated computer activities, with a grasp of the limitations.

PO6 - Life-Long Learning: Having the ability to understand and enhance in self-directed learning as a computer professional to maintain professional progress.

PO7 - Communication Efficacy: Having the ability to achieve successful communication within and outside the computing community by being able to interpret, produce, and present clear instructions, as well as design and create good documentation.

PO8 –Ethical, Societal and Environmental Concern: Having the ability to Recognize and evaluate local and global concerns relating to social well-being, environmental health and safety, legal rights and responsibilities, ethical and cultural diversity consequences of professional computer practice-associated duties.

PO9 - Individual and Team Work: Having the ability to work well in various teams and multidisciplinary settings is essential.

PO10 - Innovation and Entrepreneurship: Having the ability tofind an opportunity at the right time and employing innovation to follow that chance to generate value and money for the benefit of the individual society is essential.

IV. Programme Specific Outcomes (PSOs)

PSO1: To provide students with the critical thinking, creative problem-solving, and practical application skills necessary to succeed as an individual or part of a team.

PSO2: To educate students to the point where they can produce solutions to challenges in industry-specific domains by creating software-based systems as their capstone project.

PSO3: To prepare graduates capable of making a beneficial effect on society through their research in their chosen field.

PSO4: To gain fundamental knowledge in computational methods and tools for solving real-time problems and implanting the quest for continual learning of novel and in-demand skills.

PSO5: Ability to showcase discrete practical experiences by implementing various strategies that utilizes a variety of software techniques that are ethical and would be beneficial to the society.

V. The course of Study and scheme of Examination

S. No	Study Components	Course Title	Ins. Hrs./ Week	Credit	Title of the Paper	Maximum Marks		
						CIA	Uni. Exam	Total
SEMESTER 1								
1.	Core	Paper -1	5	3	Programming in C	25	75	100
2.	Core	Paper -2	5	3	Web Design	25	75	100
3.	Core	Paper -3	5	3	Data Structures	25	75	100
4.	Practical	Paper -1	3	2	Practical 1: Programming in C	25	75	100
5.	Practical	Paper -2	3	2	Practical 2: Web Design	25	75	100
6.	Practical	Paper -3	3	2	Practical 3: Data Structures using C	25	75	100
Internal Elective for same major students								
7.	Core Elective	Paper -1	3	3	**(to choose one out of 3)** A. Digital Logic Fundamentals B. Computer Organization and Architecture C. Fundamentals of Microprocessors	25	75	100
External Elective for other major Students (Inter/multi-disciplinary papers)								
8.	Open Elective	Paper-1	3	3	**(to choose one out of 3)** A. E-Commerce B. Introduction to Computer Application C. Principles of Internet	25	75	100
			30	21		200	600	800
SEMESTER II						CIA	Uni. Exam	Total
9.	Core	Paper-4	5	3	Programming with Java	25	75	100
10.	Core	Paper-5	4	3	Relational Database Management System	25	75	100
11.	Core	Paper-6	4	3	Open Source Technologies	25	75	100
12.	Practical	Paper-4	3	2	Practical 4: Programming with Java	25	75	100
13.	Practical	Paper-5	3	2	Practical 5: Relational Database Management System	25	75	100
14.	Practical	Paper-6	3	2	Practical 6: Open Source Technologies	25	75	100
Internal Elective for same major students								
15.	Core Elective	Paper-2	3	3	**(to choose one out of 3)** A. Operation Research B. Graph Theory C. Discrete Mathematics	25	75	100
External Elective for other major Students (Inter/multi-disciplinary papers)								
16.	Open Elective	Paper-2	3	3	**(to choose one out of 3)** A. Problem Solving Techniques B. Open Source Software C. Principal of Web Design	25	75	100

17.	Field Study		-	2		100	-	100
18.	Compulsory Paper		2	2	Human Rights	25	75	100
			30	**25**		**325**	**675**	**1000**
			120	**90**				

SEMESTER III						**CIA**	**Uni. Exam**	**Total**
19.	Core	Paper-7	5	3	Advance Java Programming	25	75	100
20.	Core	Paper-8	5	3	Unix and Shell Programming	25	75	100
21.	Core	Paper-9	5	3	Desktop Applications using C#	25	75	100
22.	Practical	Paper-7	3	2	Practical 7: Advance Java Programming	25	75	100
23.	Practical	Paper-8	3	2	Practical 8: Unix and Shell Programming	25	75	100
24.	Practical	Paper-9	3	2	Practical 9: Desktop Applications using C#	25	75	100
Internal Elective for same major students								
25.	Core Elective	Paper -3	3	3	**(to choose one out of 3)** A. Software Testing B. Software Project Management C. Object Oriented Software	25	75	100
External Elective for other major Students (Inter/multi-disciplinary papers)								
26.	Open Elective	Paper -3	3	3	**(to choose one out of 3)** A. Introduction to C B. Introduction to C# C. Introduction to Python	25	75	100
27.	MOOC Courses		-	2		-	-	100
			30	**23**		**200**	**600**	**900**

SEMESTER 1V						**CIA**	**Uni. Exam**	**Total**
28.	Core	Paper-10	4	3	Enterprise Java Programming	25	75	100
29.	Core	Paper-11	4	3	Python Programming	25	75	100
30.	Core	Paper-12	4	3	Web Applications using C#	25	75	100
31.	Core	Project Work with Viva Voce	3	2	Project Work (Compulsory)	100 (75 Project + 25 viva)		100
32.	Practical	Paper-10	3	2	Practical 10: Enterprise Java Programming	25	75	100
33.	Practical	Paper-11	3	2	Practical 11: Python Programming	25	75	100
34.	Practical	Paper-12	3	2	Practical 12:Web Applications using C#	25	75	100
Internal Elective for same major students								
35.	Core Elective	Paper -4	3	3	**(to choose one out of 3)** A. Internet of Things B. Cloud Computing	25	75	100

					C. Big Data Analysis			
External Elective for other major Students (Inter/multi-disciplinary papers)								
36.	Open Elective	Paper-4	3	3	**(to choose one out of 3)** A. Introduction to Database System B. Introduction to IoT C. Introduction to Mobile Application	25	75	100
			30	**23**		**200**	**600**	**900**
			120	**92**				**3600**

Semester: **I**   Paper type: **Core**   Paper code: **Paper -1**

Name of the Paper: **Programming in C**   Credit:**3**

Total Hours per Week: **5 Hours**Lecture Hours: 4Tutorial Hours:1Practical Hours:-

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Course Objectives

1. To enhance their analyzing and problem-solving skills and use the same for writing programs in C.
2. To develop logics and that will help them to create programs, applications in C.
3. To identify programming task involvedin a given computational problem.
4. To approachthe programming tasks using techniques learned and writepseudo-code.
5. To identify tasks in which the numerical techniques learned are applicable and apply them to write programs.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand the functional hierarchical code organization.

2. After studied unit-2, the student will be able tounderstand and create the programs on arrays and functions

3. After studied unit-3, the student will be able to work with pointers.

4. After studied unit-4, the student will be able to work with storage classes, structures and unions.

5. After studied unit-5, the student will be able work with the I/O operations.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes

2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT-I: DATA TUPE, OPERATORS   **Teaching Hours: 15**

Structure of a C program – Basic data types (int, float, char, double, void) – constants and variables (variable declaration, integer, real,float, character, variables) – operators and expressions (arithmetic operators, relational operators, logical operators, bitwise operators, type casting, type conversion, enumerated data type, typedef) – Control Constructs (if, switch, while, do…while, for, break and continue, exit() function, goto and label).

UNIT-II: ARRAYS AND FUNCTIONS   **Teaching Hours: 15**

Arrays (declaration, one and two dimensional arrays) - Character Arrays and Strings. Function Fundamentals (General form, Function Definition, Function arguments, return value) – Parameter passing: call-by-value and call-by-reference – Recursion – Passing Arrays to Function – Passing Strings to Function.

UNIT-III: POINTERS   **Teaching Hours: 16**

Understanding Pointers – Accessing the Address of a Variable – Declaring the Pointer Variables – Initialization of Pointer Variables – Accessing a Variable through its Pointer – Pointer Expressions – Pointers and Arrays – Pointers and Character Strings – Array of Pointers – Pointers as Function Arguments – Functions returning Pointers – Pointers to Functions.

UNIT-IV: STORAGE CLASSES, STRUCTURES AND UNIONS   **Teaching Hours: 14**

Scope rules (Local variables and global variables, scope rules of functions) -Type modifiers and storage class specifier. Structures – Basics of Structure – Declaring of Structure – Referencing

Structure elements - Array of Structures – Nesting of Structures - Passing Structures to function – Pointers and Structures - Unions.

UNIT-V: FILE MANAGEMENT IN C   **Teaching Hours: 15**

Introduction – Defining and Opening a File – Closing a File – Input / Output Operations on Files – Command Line Arguments.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extra-curricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. E.Balagurusamy, "Programming in ANSI C", Seventh Edition, McGraw Hill Education Private Limited, NewDelhi: 2017.

References

1. YashavantKanetkar, "Let us C", BPB Publications, Tenth Edition - New Delhi: 2010

2. Ashok N.Kamthane, "Programming in C", Second Impression, Pearson: 2012.

Web References

1. http://www.c4learn.com/?gclid=COK1y6nHk7wCFcUA4godmlgAKA/
2. http://www.cprogramming.com/tutorial/c-tutorial.html/
3. http://www.tutorialspoint.com/cprogramming/

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	M	S	M	L	L	M	S	M	S	M	S	S
CO2	M	M	S	M	S	M	L	L	M	S	M	S	M	S	S
CO3	S	M	S	M	M	M	L	L	M	S	M	S	M	S	S
CO4	S	M	S	M	M	S	L	L	M	S	M	S	S	S	S
CO5	S	M	S	M	M	S	L	L	M	S	M	S	S	S	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **I**   Paper type: **Core**   Paper code: **Paper -2**

Name of the Paper: **Web Design**   Credit:**3**

Total Hours per Week: **5 Hours**Lecture Hours:4   Tutorial Hours: 1   Practical Hours:-

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Course Objectives

1. To understand the basic of HTML structure, tags, and presentation elements.
2. To understand the basic of HTML Images and Links.   To understand the basic of CSS syntax, Inclusion, Measurement units andvarious CSS Properties.
3. To understand the basic of HTML List and Tables.
4. To understand the basic of Frames elements and Forms elements.
5. To understand the basic of CSS syntax, Inclusion, Measurement units and various CSS Properties.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to develop Website Accessibility.
2. After studied unit-2, the student will be able tomake detailed understanding of the structure of a page with the help of HTML image and link tags.
3. After studied unit-3, the student will be able to develop the innovative designing ability in designing web page with list and table tags.
4. After studied unit-4, the student will be able to understand the basic of HTML frames elements and Forms elements.
5. After studied unit-5, the student will be able to understand the basic of CSS syntax, Inclusion, Measurement units and various CSS Properties.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes

3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT-I: HTML BASICS AND FORMATTING TAGS **Teaching Hours: 16**

HTML Introduction – Web page: Static & Dynamic Page - Web Browsers - HTML Versions - HTML Tags – HTML Elements – HTML Attributes - HTML Editors - HTML Page Structure - HTML Basic tags: Head – Title – Body - Background - Heading tags – Paragraph tag – HR tag - Line break. Presentational Element: Bold – Italic – Underline – Subscripted –Superscripted – Strike through - Emphasized – Strong – Inserted – Deleted. Phrase Elements: Abbreviation – Acronyms - Text Direction - Block quoted - Short quotation – citation – definition - Computer output tags: computer code – keyboard – variable – preformatted.

UNIT-II: IMAGE, LINKS **Teaching Hours: 14**

HTML Images - Src Attribute - Dynsrc Attribute - Alt Attribute - Setting Height and Width of an Image - HTML Links – Hyperlinks – Hyperlinks Syntax - The target attribute – creating image as a link.

UNIT-III: LIST AND TABLE **Teaching Hours: 15**

HTML List: Ordered List – Unordered List – Definition List- HTML Tables: Table attributes (Cell spacing, Cell Padding, Border, Width, Height) - Table Headers – Table Row – Define Table - Caption – Rows span – Cols span.

UNIT-IV: FRAMES AND FORMS **Teaching Hours: 15**

Frames: The Frameset, No Frame Element – Creating Link between Frames – Nested Frameset – Forms. HTML Form: Text Fields – Password Field – Radio Buttons – Checkboxes – Submit Button – Reset Button – Button – Select – option – text area.

UNIT-V: CSS   **Teaching Hours: 15**

CSS Introduction – CSS Syntax – Inclusion: External CSS – Internal CSS – Inline CSS – Measurement Units – Color – Background – Font – Text – Color – Images - Links – Tables – Borders – Margin – List – Padding.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Jon Ducktt, "Web Programming with HTML, CSS& Java script", Wiley Publishing, New Delhi,2013.

   Unit - I : Ch. 1
   Unit - II : Ch. 2, 3
   Unit - III : Ch. 4
   Unit – IV : Ch. 5 & 6
   Unit – V : Ch. 7 & 8

References

1. Joel Sklar. Principles of Web Design. Singapore :Thomson Asia Pvt. Ltd, 2000 Powell,
2. Thomas A. 2. Web Design – The Complete Reference. Tata McGraw Hill Edition, 2000.

Web References

Online Tutorial

1. http://www.w3schools.com/html/html_intro.asp
2. http://www.tutorialspoint.com/css

Online Quiz

1. http://www.pskills.org/html.jsp
2. 2. http://www.w3schools.com/quiztest/quiztest.asp?qtest=HTML

Online Compiler

1. https://www.tutorialspoint.com/try_html_online.php
2. https://html-online.com/editor

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	M	S	M	L	M	M	S	M	S	M	S	S
CO2	S	M	S	M	L	M	L	M	M	S	M	S	M	M	S
CO3	S	M	S	S	L	M	L	M	S	S	M	S	M	M	S
CO4	S	M	S	S	L	M	L	S	S	S	M	S	M	M	S
CO5	S	M	S	S	L	M	L	S	S	S	M	S	M	M	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **I**   Paper type: **Core**   Paper code: **Paper -3**

Name of thePaper: **Data Structures**   Credit:**3**

Total Hours per Week: **5 Hours**Lecture Hours: 4   Tutorial Hours:1Practical Hours: -

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Course Objectives

1. To understand the performance of the implementations of basic linear data structures.
2. To understand the various operations of stack and queue.
3. To implement the linked data structures such as linked list and binary trees.
4. To be familiar with several sorting and searching algorithms.
5. To be familiar with some graph algorithms such as shortest path and minimum spanning tree.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand the performance of the implementations of basic linear data structures.
2. After studied unit-2, the student will be able tounderstand the various operations of stack and queue.
3. After studied unit-3, the student will be able to implement the linked data structures such as linked list and binary trees.
4. After studied unit-4, the student will be able to familiarize with several sorting and searching algorithms.
5. After studied unit-5, the student will be able to familiarize with some graph algorithms such as shortest path and minimum spanning tree.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes

2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT-I: ARRAYS AND LINKED LIST   **Teaching Hours:15**

Arrays: Operations with Array – One dimensional array – Two dimensional arrays – Special Matrices. Linked List: Implementation of List – Linear List Concepts – Insertion, Deletion, Retrieval and traversal – Linked List Concepts – Linked List Algorithms – Circular Linked List – Doubly Linked List.

UNIT-II: STACK AND QUEUES   **Teaching Hours:15**

Stack: Basic Stack Operations – Stack Linked List Implementation – Stack Applications – Reversing Data, Postponement – Infix to Postfix Transformation, Evaluating Postfix Expressions.Queue: Queue operations – Queue Linked List Design – Queuing Theory – Queue Applications- Queue Simulation.

UNIT-III: TREES   **Teaching Hours: 15**

Basic Tree Concepts: Terminology – Tree Representation – Binary Trees – Binary Tree Traversal – Expression Trees – Binary Search Trees.

UNIT-IV: SEARCHING AND SORTING   **Teaching Hours: 15**

Searching: Hashed List Searches –Basic Concepts – Hashing Methods – Hashing Algorithm – Collision Resolution.Sorting: Internal Sort:Shell Sorts – Quick SortHeap Sort. External Sorts: Merging Ordered Files – Merging Unordered Files.

UNIT-V: GRAPHS   **Teaching Hours: 15**

Graphs: Terminology – Operations – Graph Storage Structures – Graph Algorithms – Networks – Minimum Spanning Tree – Shortest Path Algorithm.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Richard F. Gilberg and Behrouz A. Forouzan,"Data structures: A pseudo code Approach with C++", India Edition, First India Reprint, 2007.
   Unit – I :Ch 3.1 – 3.3, 3.6
   Unit – II :Ch 4.1 – 4.3, 5.1 – 5.4
   Unit – III :Ch 7.1 – 7.4, 8.1
   Unit – IV :Ch 2.3 – 2.4, 11.2, 11.4, 11.6
   Unit – V :Ch 12.1 – 12.5

References

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", 3rd Edition, Pearson Education, 2006.

2. Ellis Horowitz, SartajSahni and Dinesh Mehta, "Fundamentals of Data Structures in C++", 2nd Edition, Universities Press(India) Pvt.Ltd, 2009.

Web References

Online Tutorial

1. www.cyberdim.com/vin/learn.html
2. www.eecs.wsy.edu
3. www.wrox.com/store/cerfinet.com

Online Quiz

1. https://www.tutorialspoint.com/data_structures_algorithms/data_structures_algorithms_online_quiz.htm
2. http://quiz.geeksforgeeks.org/data-structure/

Online Compiler

1. http://withoutbook.com/OnlineTestStart.php?quizId=2
2. https://www.wiziq.com/online-tests

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	M	S	L	L	M	M	M	M	S	M	M	S
CO2	M	M	S	M	L	M	L	M	M	M	M	S	M	M	S
CO3	S	S	S	M	L	M	M	M	M	L	M	S	S	L	S
CO4	S	S	S	M	L	L	M	M	M	L	M	S	S	L	S
CO5	S	S	S	M	L	L	M	M	M	L	M	S	S	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **I**   Paper type: **Practical**   Paper code: **Paper -1**

Name of thePaper: **Practical 1: Programming in C**   Credit:**2**

Total Hours per Week: **3 Hour** Lecture Hours:-Tutorial Hours:-Practical Hours:3

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Course Objectives

1. To enhance their analyzing and problem-solving skills and use the same for writing programs in C.
2. To develop logics and that will help them to create programs, applications in C.
3. To identify programming task involvedin a given computational problem.
4. To approachthe programming tasks using techniques learned and writepseudo-code.
5. To identify tasks in which the numerical techniques learned are applicable and apply them to write programs.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand the functional hierarchical code organization.

2. After studied unit-2, the student will be able tounderstand and create the programs on arrays and functions

3. After studied unit-3, the student will be able to work with pointers.

4. After studied unit-4, the student will be able to work with storage classes, structures and unions.

5. After studied unit-5, the student will be able work with the I/O operations.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating

1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

1. Data types

2. Operators and Expressions

3. Decision making statement

4. Looping statement

5. Arrays

6. Functions

7. Structures

8. Unions

9. Pointer

10. Files

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	M	S	M	L	L	M	S	M	S	M	S	S
CO2	M	M	S	M	S	M	L	L	M	S	M	S	M	S	S
CO3	S	M	S	M	M	M	L	L	M	S	M	S	M	S	S

| CO4 | S | M | S | M | M | S | L | L | M | S | M | S | S | S | S |
| CO5 | S | M | S | M | M | S | L | L | M | S | M | S | S | S | S |

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **I**   Paper type: **Practical**   Paper code: **Paper -2**

Name of thePaper: **Practical 2: Wed Design**   Credit:**2**

Total Hours per Week: **3 Hours**Lecture Hours: -Tutorial Hours:-Practical Hours: 3

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Course Objectives

1. To understand the basic of HTML structure, tags, and presentation elements.
2. To understand the basic of HTML Images and Links.   To understand the basic of CSS syntax, Inclusion, Measurement units andvarious CSS Properties.
3. To understand the basic of HTML List and Tables.
4. To understand the basic of Frames elements and Forms elements.
5. To understand the basic of CSS syntax, Inclusion, Measurement units and various CSS Properties.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to develop Website Accessibility.
2. After studied unit-2, the student will be able tomake detailed understanding of the structure of a page with the help of HTML image and link tags.
3. After studied unit-3, the student will be able to develop the innovative designing ability in designing web page with list and table tags.
4. After studied unit-4, the student will be able to understand the basic of HTML frames elements and Forms elements.
5. After studied unit-5, the student will be able to understand the basic of CSS syntax, Inclusion, Measurement units and various CSS Properties.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes

2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

1. Basic HTML tags

2. Working with Images

3. Text formatting tags

4. Link 5. List 6. Tables

7. Frames

8. HTML Form Controls

9. CSS Inclusion and Properties

10. Internal, external and inline CSS.

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	M	S	M	L	M	M	S	M	S	M	S	S
CO2	S	M	S	M	L	M	L	M	M	S	M	S	M	M	S
CO3	S	M	S	S	L	M	L	M	S	S	M	S	M	M	S
CO4	S	M	S	S	L	M	L	S	S	S	M	S	M	M	S
CO5	S	M	S	S	L	M	L	S	S	S	M	S	M	M	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **I**   Paper type: **Practical**   Paper code: **Paper -3**

Name of thePaper: **Practical 3: Data Structures using C**   Credit:**2**

Total Hours per Week: **3 Hours**Lecture Hours:-Tutorial Hours:-Practical Hours: 3

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Course Objectives

1. To understand the performance of the implementations of basic linear data structures.
2. To understand the various operations of stack and queue.
3. To implement the linked data structures such as linked list and binary trees.
4. To be familiar with several sorting and searching algorithms.
5. To be familiar with some graph algorithms such as shortest path and minimum spanning tree.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand the performance of the implementations of basic linear data structures.
2. After studied unit-2, the student will be able tounderstand the various operations of stack and queue.
3. After studied unit-3, the student will be able to implement the linked data structures such as linked list and binary trees.
4. After studied unit-4, the student will be able to familiarize with several sorting and searching algorithms.
5. After studied unit-5, the student will be able to familiarize with some graph algorithms such as shortest path and minimum spanning tree.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes

3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

1. Matrix Representation

2. Sparse Matrix Representation

3. Stack Representation

4. Queue Representation

5. Linked List Representation

6. Doubly Linked List Representation

7. Binary Tree Representation

8. Searching Algorithms

9. Sorting Algorithms

10. Graph Representation

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	M	S	L	L	M	M	M	M	S	M	M	S
CO2	M	M	S	M	L	M	L	M	M	M	M	S	M	M	S
CO3	S	S	S	M	L	M	M	M	M	L	M	S	S	L	S
CO4	S	S	S	M	L	L	M	M	M	L	M	S	S	L	S
CO5	S	S	S	M	L	L	M	M	M	L	M	S	S	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **I**   Paper type: **Core Elective**   Paper code: **Paper -1**

Name of thePaper: **A:Digital Logical Fundamentals**   Credit:**3**

Total Hours per Week: **3 Hours**Lecture Hours: 3Tutorial Hours:-Practical Hours:-

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Course Objectives:

- To explore the Number System, Number Conversion from one Base to another Base andComplements and To simplify the Boolean Functions using K-Map Method
- To learn Combinational circuits as Adders and Subtractors, Encoders and Decoders.
- To learn the different types of Flip-Flops such as SR Flip flop, JK Flip flop, T Flip flop and D Flip flop.
- To understand the memory units and ALU.
- To understand the concepts such as Accumulator and instruction set.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able perform conversions and arithmetic operations in various number systems and to Simplify using laws of Boolean algebra and Karnaugh map method
2. After studied unit-2, the student will be able tounderstand the combinational circuits such as Adders and Subtractors, Encoders and Decoders.
3. After studied unit-3, the student will be able to design various combinational and sequential circuits using flip flops
4. After studied unit-4, the student will be able to understand memory units and ALU.
5. After studied unit-5, the student will be able understand accumulator and instruction set.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	No	No

2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	No	No
4	Yes	Yes	Yes	Yes	No	No
5	Yes	Yes	Yes	Yes	No	No

UNIT-I: NUMBER SYSTEM   `   **Teaching Hours: 9**

Number system-converting numbers from one base to another – Complements – binary codes-integrated circuits-Boolean algebra-properties of Boolean algebra -Boolean functionsCanonical and standard form-logic operations-Logic gates-K map up to 6 variables-Don't care condition-Sum of products and product of sum simplification-Tabulation method.

UNIT-II: ADDER AND SUBTRACTOR   **Teaching Hours: 9**

Adder–subtractor-code converter-analyzing a combinational Circuit-Multilevel NAND and NOR circuits-properties of XOR and equivalence function-Binary parallel Adder-Decimal Adder – Magnitude Comparator-Decoder-Multiplexer-ROM-PLA.

UNIT-III: FLIP FLOPS   **Teaching Hours: 9**

Flip flops-Triggering of flip flops-Analyzing a sequential circuit-State Reduction-Excitation tables-Design of sequential circuits-Counters-Design with state equation-Registers-Shift registers-Ripple and Synchronous Counters.

UNIT-IV: MEMORY UNITS   **Teaching Hours: 9**

Memory unit-Bus Organization-Scratch Pad Memory-ALU-Design of ALU-Status RegisterEffects of Output carry-Design of shifter-Processor unit-Microprogramming-Design of Specific Arithmetic Circuits

UNIT-V: ACCUMULATOR   **Teaching Hours: 9**

Accumulator-Design of Accumulator-Computer configuration-Instruction and Data formatsInstruction sets-Timing and Control-Execution of Instruction-Design of computer-H/W control-PLA control and Micro program control.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. M. MorrisMano, "Digital Logic and Computer Design", PHI, 6/E, 2014.

References

1. M.M .Mano and C.R.Kime, "Logic and Computer Fundamentals", Pearson 4/E, 2010.

2. Thomas C.Barteel, "Digital Computer Fundamentals", Tata McGraw Hill, 6/E, 20102.

3. Thomas C.Barteel, "Digital Computer Fundamentals", Tata McGraw Hill, 6/E, 2010

Web References

1. http:// https://www.tutorialspoint.com/digital electronics-concepts.htm/
2. http://www.indiabix.com/online-test/digital electronics-test/

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	M	S	-	S	L	-	-	-	-	M	S	-	-	-
CO2	L	M	S	-	L	L	-	-	-	L	M	S	-	L	-
CO3	L	M	S	-	L	L	-	-	-	L	M	S	-	L	-
CO4	L	M	S	-	L	L	-	-	-	L	M	S	-	L	-
CO5	L	M	S	-	L	L	-	-	-	L	M	S	-	L	-

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **I**   Paper type: **Core Elective**   Paper code: **Paper -1**

Name of the Paper: **B:Computer Organization And Architecture**   Credit:**3**

Total Hours per Week: **3 Hour** Lecture Hours: 3   Tutorial Hours:-Practical Hours:-

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Course Objectives

1. To know the basic architecture of computer.
2. To understand the organization of a computer system in terms of its main components.
3. To understand different processor architectures and understand input/output mechanisms.
4. To understand the various parts of a system memory hierarchy.
5. To study the different ways of communicating with I/O devices and standard I/O interfaces.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to know the basic architecture of computer.

2. After studied unit-2, the student will be able tounderstand the organization of a computer system in terms of its main components.

3. After studied unit-3, the student will be able to understand different processor architectures and understand input/output mechanisms.

4. After studied unit-4, the student will be able to study the different ways of communicating with I/O devices and standard I/O interfaces.

5. After studied unit-5, the student will be able to understand the various parts of a system memory hierarchy.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	No	No
2	Yes	Yes	Yes	Yes	No	No

3	Yes	Yes	Yes	Yes	No	No
4	Yes	Yes	Yes	Yes	No	No
5	Yes	Yes	Yes	Yes	No	No

UNIT-I: BASIC COMPUTER ORGANIZATION AND DESIGN   Teaching Hours: 9

Instruction Codes: Stored Program Organization – Indirect Address - Computer Registers: Common Bus System –Logic Gates - Computer Instructions: Instruction Set Completeness - Timing and Control - Instruction Cycle: Fetch and Decode – Determine the Type of Instruction – Register-Reference Instructions.

UNIT-II: CENTRAL PROCESSING UNIT   Teaching Hours: 9

General Register Organization : Control Word – Examples of Micro-operations - Instruction Formats : Three-Address, Two-Address, One-Address, Zero-Address and RISC Instructions - Addressing Modes : Example – Data Transfer and Manipulation : Data Transfer Instruction – Data Manipulation Instructions.

UNIT-III: INPUT/ OUTPUT ORGANIZATION – ITeaching Hours: 9

Peripheral Devices: ASCII Alphanumeric Characters - Input /Output Interface: I/O Bus and Interface Modules – I/O Vs. Memory Bus – Isolated Vs. Memory-Mapped I/O – Example of I/O Interface - Asynchronous Data Transfer: Strobe Control – Handshaking.

UNIT-IV: INPUT/ OUTPUT ORGANIZATION - II   Teaching Hours: 9

Modes of Transfer: Example of Programmed I/O – Interrupt Initiated I/O – Software Considerations - Priority Interrupt: Daisy-Chaining Priority – Parallel Priority Interrupt – Priority Encoder – Interrupt Cycle – Software Routines - Direct Memory Access: DMA Controller – DMA Transfer.

UNIT-V: MEMORY ORGANIZATION   **Teaching Hours: 9**

Memory Hierarchy - Main Memory: RAM and ROM Chips – Memory Address Map – Memory Connection to CPU - Auxiliary Memory: Magnetic Disks – Magnetic Tape - Associative Memory: Hardware Organization – Match Logic – Read Operation – Write Operation.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Morris Mano M. "Computer System Architecture". New Delhi: Prentice Hall of India Private Limited, 2011

References

1. William Stallings. "Computer Organization and Architecture". 8th edition. Pearson Publication, 2010

2. Morris Mano. "Digital Login and Computer Design". New Delhi: Prentice Hall of India Private Limited, 2001.

Web References

1. www.tutorialspoint.com/computer_logical_organization/
2. www.tutorialspoint.com/computer_logical_organization/cpu_architecture.html
3. www.tutorialspoint.com/computer...organization/computer logicalorganization

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	S	M	L	M	M	M	M	M	S	M	L	S
CO2	S	M	S	S	M	L	M	M	M	M	M	S	M	L	S
CO3	S	S	S	S	M	M	L	S	M	M	M	S	M	L	S
CO4	S	S	S	S	M	M	L	S	L	M	M	S	M	L	S
CO5	S	S	S	S	M	M	L	S	L	M	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **I**   Paper type: **Core Elective**   Paper code: **Paper -1**

Name of the Paper: **C:Fundamentals of Microprocessors** Credit:**3**

Total Hours per Week: **3 Hours**Lecture Hours: 3   Tutorial Hours:-   Practical Hours:-

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Course Objectives

1. To understand the architecture of 8085 and 8051.
2. To understand the knowledge about conversions.
3. To understand the features of 8255.
4. To understand the architecture of 8086 and Pentium Microprocessors.
5. To understand the architecture of 8051 Microcontroller.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand the architecture of 8085 and 8051.

2. After studied unit-2, the student will be able toimpart the knowledge about conversions.

3. After studied unit-3, the student will be able to understand the basic idea about the 8255.

4. After studied unit-4, the student will be able tounderstand the architecture of 8086 and Pentium Microprocessors.

5. After studied unit-5, the student will be Easy to understand 8051Microcontroller.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	No	No

2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	No	No
5	Yes	Yes	Yes	Yes	No	No

UNIT – I: INTRODUCTION   **Teaching Hours: 9**

8085 MICROPROCESSOR-Introduction to Microprocessor- 8085 Architecture and its operations- 8085 pin description-8085 instruction Set and Classification -8085 addressing modes.

UNIT – II: 8085 PROGRAMMING   **Teaching Hours: 9**

8085 PROGRAMMING-Writing assembly level Programs -Multi-byte addition- Multibyte Subtraction-BCD addition -BCD subtraction-BCD Multiplication-BCD division – BCD to Binary and Binary to BCD conversion- ASCII to BCD and BCD to ASCII Conversion – ASCII to Binary and Binary to ASCII Conversion.

UNIT – III : INTEL 8255 PROGRAMMABLE PERIPHERAL INTERFACE

Teaching Hours: 9

Intel 8255 Programmable Peripheral Interface: Features of 8255 – Block diagram of Intel 8255- Operating Modes and control words of 8255 – Programming Examples – Interfacing LEDs – Interfacing Seven Segment Displays – Traffic Light control.

UNIT –IV: 8086 MICROPROCESSOR   **Teaching Hours: 9**

Introduction to 8086 Microprocessor- Architecture of 8086 – Pin details of 8086. Advanced Microprocessor: 80186 Architecture - 8086 Architecture – Pentium Microprocessor: Architecture of Pentium. Other Versions of Pentium: Pentium Pro Processor - Pentium II Processor - Pentium III Processor- Pentium 4 Processor

UNIT –V: 8051 MICROCONTROLLER   **Teaching Hours: 9**

8051 MICROCONTROLLER-Introduction to 8051 Microcontroller - Intel's MCS -51 series Microcontrollers - Intel 8051 Architecture –Memory organization – Internal RAM StructurePower Control in 8051 –Stack operation.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Ramesh Goankar "Microprocessors and Microcontroller", Prentice Hall, 5th edition, 2002. (Unit I & Unit II)

2. N.SenthilkumarM.Saravannan, S.Jeevananthan "Microprocessor and Microcontrollers" Oxford University Press, 1/E, 2010 (unit III, Unit IV & Unit V)

References

1. Douglas V. Hall "Microprocessors and Interfacing ", Tata McGraw Hill, 2/E, 2006.

2. Krishna kant "Microprocessors and Microcontrollers Architecture Programming and system design 8086,8086,8051,8096, PHI Learning Pvt Ltd. New Delhi, 2/E, 2010.

3. Barry B. Brey, "The Intel Microprocessor-8086/8088, 80186,286, 386, 486, Pentium Processor", Prentice Hall of India Pvt Ltd, 8th Edition, 1998.
4. Yu-chang Lin and Clean, "Microprocessor Systems the 8086/8088 family architecture, Programming and Design", Prentice Hall of India Pvt Ltd, 2nd edition, 2001.

Web References

1. http:// https://www.tutorialspoint.com/8085/
2. http://www.indiabix.com/online-test/8085 mup-test/

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	M	M	M	L	M	M	S	M	S	M	M	S
CO2	S	M	S	M	M	M	L	M	M	S	M	S	M	M	S
CO3	S	M	S	M	M	M	L	S	M	S	M	S	M	M	S
CO4	S	M	S	M	M	M	L	S	L	S	M	S	M	L	S
CO5	S	M	S	M	M	M	L	S	L	S	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **I**   Paper type:**Open Elective**   Paper code: **Paper -1**

Name of the Paper: **A: E-Commerce**Credit:**3**

Total Hours per Week: **3 Hours**Lecture Hours: 3   Tutorial Hours:-Practical Hours:-

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Course Objectives

1. To demonstrate an understanding of the foundations and importance of E-commerce
2. To demonstrate an understanding of retailing in E-commerce by: analyzing branding and pricing strategies, using and determining the effectiveness of market research and assessing the effects of disintermediation.
3. To analyze the impact of E-commerce on business models and strategy
4. To describe Internet trading relationships including Business to Consumer, Businessto-Business, Intra-organizational.
5. To describe the key features of Internet, Intranets and Extranets and explain how they relate to each other.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to know the fundamentals of E-Commerce.

2. After studied unit-2, the student will be able tounderstand the retailing in E-commerce by: analysing branding and pricing strategies, using and determining the effectiveness of market research and assessing the effects of disintermediation.

3. After studied unit-3, the student will be able to understand techniques of Customer Relationship Management.

4. After studied unit-4, the student will be able to understand the M-Commerce and its applications.

5. After studied unit-5, the student will be able to study the different ways of communicating through Internet, Intranet and Extranet.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	No	No	No	No
2	Yes	Yes	No	No	No	No
3	Yes	Yes	No	No	No	No
4	Yes	Yes	No	No	No	No
5	Yes	Yes	No	No	No	No

UNIT-I: E-COMMERCE FUNDAMENTALS   **Teaching Hours: 9**

Introduction - The e-commerce environment - The e-commerce marketplace - Focus on portals - Location of trading in the marketplace - Commercial arrangement for transactions - Focus on auctions - Business models for e-commerce - Revenue models - Focus on internet start-up companies -E-business infrastructure: Introduction on Internet - Internet standards - Focus on controls the internet - Managing e-business infrastructure - Focus on web service nd service-oriented - Focus on new access devices.

UNIT-II: E-PROCUREMENT   **Teaching Hours: 9**

Introduction - Drivers of e-procurement - Focus on estimating e-procurement cost savings - Risks and impacts of e-procurement - Implementing e-procurement - Focus on electronics B2B

marketplaces - The future of e-procurement E-marketing: Introduction - E-marketing planning - Situation analysis - Objective setting – Strategy - Focus on characteristics of new-media marketing communications – Tactics - Focus on online branding – Actions - Control.

UNIT-III: CUSTOMER RELATIONSHIP MANAGEMENT   Teaching Hours: 9

Introduction:e-CRM-conversion marketing - the online buying process - customer acquisition management - focus on marketing communications for customer acquisition - customer retention management focus on excelling in e- commerce service quality - customer extension - Analysis and design: Introduction - process modeling - Data modeling - Design for e-business - Focus on user centered site design - Focus on security design for e-business.

UNIT-IV: M-COMMERCE   Teaching Hours: 9

Introduction to m-commerce: Emerging applications - different players in m-commerce – m-commerce life cycle - Mobile financial services - mobile entertainment services - and proactive service management.

UNIT-V: MANAGEMENT OF MOBILE COMMERCE SERVICES   Teaching Hours: 9

Content development and distribution to hand-held devices - content caching - pricing of mobile commerce services - The emerging issues in mobile commerce: The role of emerging wireless LANs and 3G/4G wireless networks - personalized content management - implementation challenges in m-commerce - futuristic m-commerce services.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.
b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise
c. Workshops, preparing technical term dictionaries from text books and reference books.
d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher
e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Dave Chaffey, "E-Business and E-Commerce Management", 3rd Edition, 2009, Pearson Education.

References

1. Henry Chan, Raymod Lee and etl., "E-Commerce Fundamental and Applications", Wiley.
2. Brian Mennecke and Troy Strader, "Mobile Commerce: Technology, Theory".
3. Nansi Shi, "Mobile Commerce Applications", IGI Global, 2004
4. Gary P. Schneider, "Electronic Commerce", 7th Edition, CENGAGE Learning India, New Delhi.
5. K.K. Balaji, D.Nag "E-Commerce", 2nd Edition, McGraw Hill Education, New Delhi.
6. P.T.Joseph," E-Commerce an Indian Perspective," PHI Publication, New Delhi.
7. Phaskar Bharat, "Electronic Commerce – Technology and Application", McGraw Hill.

Web References

1. www.feinternational.com/blog/what-is-e-commerce-an-introduction-to-the-industry/
2. www.abetterlemonadestand.com/what-is-ecommerce/

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5

CO1	L	M	S	M	M	M	M	L	M	S	M	S	M	M	L
CO2	L	M	S	M	M	M	M	L	M	S	M	S	M	M	L
CO3	L	M	S	M	M	M	M	L	M	S	M	S	M	M	L
CO4	L	M	S	M	M	M	M	L	M	S	M	S	M	M	L
CO5	L	M	S	M	M	M	M	L	M	S	M	S	M	M	L

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **I**   Paper type: **Open Elective**   Paper code: **Paper -1**

Name of the Paper: **B: Introduction to Computer Application**   Credit:**3**

Total Hours per Week: **3 Hours**   Lecture Hours: 3Tutorial Hours:-   Practical Hours:-

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Course Objectives

1. To know about computer and basic applications of computer.
2. To get knowledge about operating system
3. To aim at imparting a basic level word processing
4. To receive knowledge on spreadsheet creation
5. To impart knowledge on the creation of presentation.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be Know about computer and basic applications of computer.

2. After studied unit-2, the student will be able toreceive the knowledge about operating system

3. After studied unit-3, the student will be able to know about word processing and to create word documents with various features

4. After studied unit-4, the student will be able tocreate the spreadsheets with formulas and functions.

5. After studied unit-5, the student will be able tocreate the presentations.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Appling	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	No	No	No	No
2	Yes	Yes	No	No	No	No
3	Yes	Yes	Yes	Yes	No	No
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT I: KNOWING COMPUTER   **Teaching Hours: 9**

What is Computer - Basic Applications of Computer - Components of Computer System - Central Processing Unit (CPU) – VDU - Keyboard and Mouse - Other input/output Devices - Computer Memory - Concepts of Hardware and Software - Concept of Computing - Data and Information; Applications of IECT - Connecting keyboard – mouse - monitor and printer to CPU and checking power supply.

UNIT II: OPERATING COMPUTER USING GUI BASED OPERATING SYSTEM
                                          Teaching Hours: 10

What is an Operating System - Basics of Popular Operating Systems - The User Interface - Using Mouse - Using right Button of the Mouse and Moving Icons on the screen - Use of Common Icons - Status Bar - Using Menu and Menu – selection - Running an Application - Viewing of File - Folders and Directories - Creating and Renaming of files and folders -

Opening and closing of different Windows - Using help - Creating Short cuts - Basics of O.S Setup - Common utilities.

UNIT III: UNDERSTANDING WORD PROCESSING **Teaching Hours: 8**

Word Processing Basics - Opening and Closing of documents - Text creation and Manipulation - Formatting of text - Table handling - Spell check -language setting and thesaurus - Printing of word document.

UNIT IV: USING SPREAD SHEET **Teaching Hours: 9**

Basics of Spreadsheet - Manipulation of cells - Formulas and Functions - Editing of Spread Sheet - printing of Spread Sheet.

UNIT V: MAKING SMALL PRESENTATION **Teaching Hours: 9**

Basics of presentation software - Creating Presentation - Preparation and Presentation of Slides - Slide Show - Taking printouts of presentation / handouts.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.
b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise
c. Workshops, preparing technical term dictionaries from text books and reference books.
d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher
e. Forming digital library: collecting text and reference books, course material.
f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.
g. Extracurricular and cultural activities may be framed through the syllabus content.
h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Introduction to Computer Applications, TNAU, Tamil Nadu.
   https://www.agrimoon.com/introduction-to-computer-applications-pdf-book/

Web References

1. https://homepage.cs.uri.edu/faculty/wolfe/book/Readings/Reading01.htm
2. https://peda.net/kenya/ass/subjects2/computer-studies/form-1/itc2

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	L	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	L	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	L	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **I**   Paper type: **Open Elective**   Paper code: **Paper -1**

Name of the Paper: **C: Principles of Internet**   Credit:**3**

Total Hours per Week: **3 Hours** Lecture Hours: 3   Tutorial Hours:-   Practical Hours:-

………………………………………………………………………………………………

Course Objectives

1. To learn the basics of Internet.
2. To impart the knowledge on connecting the internet
3. To provide fundamental knowledge in WWW
4. To give the knowledge on multimedia.
5. To learn the internet security concepts.

Course Outcomes (five outcomes for each units should be mentioned)

1.   After studied unit-1, the student will be to know about to learn the basics of Internet.
2. After studied unit-2, the student will be to know about to connecting the internet.
3. After studied unit-3, the student will be able to provide fundamental knowledge in WWW.
4. After studied unit-4, the student will be to know about multimedia usage in internet.
5. After studied unit-5, the student will be to understand the internet security concepts.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	No	No	No	No
2	Yes	Yes	No	No	No	No
3	Yes	Yes	Yes	Yes	No	No
4	Yes	Yes	Yes	Yes	No	No
5	Yes	Yes	No	No	No	No

UNIT-I: INTERNET   Teaching Hours: 9

The wired world of the internet –Information travels across the internet –TCP/IP – Understanding internet addresses and domains –Anatomy of web connections –Internet file types. Internet's Underlying Architecture: Domain name system –Routers –The internet's client/server architecture.

UNIT-II: CONNECTING TO THE INTERNET   Teaching Hours: 9

Connecting your computer –Connecting to the internet from online services –ISDN –The internet/television connection –Network computers –DSL(Digital Subscriber Line). Communicating on the internet:E-mail–Usenet and newsgroups –Internet chat and instant messaging –Making phone calls on the internet.

UNIT-III: WORLD WIDE WEB   Teaching Hours: 9

Webpages –Web browsers –Markup Languages –Hypertext –Image maps and interactive forms –Web host servers –Websites with databases. Common Internet Tools:Gophers – Telnet –FTP and downloading files –Searching the internet.

UNIT-IV: MULTIMEDIA ON THE INTERNET   Teaching Hours: 9

Audio on the internet –Video on the internet –Intranet and shopping on the internet.

UNIT-V: SAFEGUARDING THE INTERNET   Teaching Hours: 9

Firewalls–Viruses –Digital certificates.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.
b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise
c. Workshops, preparing technical term dictionaries from text books and reference books.
d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Preston Gralla, "How the Internet works", 10thEdition, Que publishers, 2014.

References

1. Raj Kamal, "Internet and Web Technologies", Tata McGraw Hill, 2002.
2. C Xavier, "World Wide Web design with HTML",TataMc-Graw Hill, 2008.

Web Reference

www.informatics.buzdo.com/p912-internet-principles.htm

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	M	M	M	S	S	M	L	M	S	M	M	M
CO2	M	M	S	M	M	M	S	S	M	L	M	S	M	M	M
CO3	M	M	S	M	M	M	S	S	M	L	M	S	M	M	M
CO4	M	M	S	M	M	M	S	S	M	L	M	S	M	M	M
CO5	M	M	S	M	M	M	S	S	M	L	M	S	M	M	M

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **II**   Paper type: **Core**   Paper code: **Paper-4**

Name of the Paper:**Programming With Java**   Credit:**3**

Total Hours per Week:**5 Hours**Lecture Hours: 4Tutorial Hours:1Practical Hours:-

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Course Objectives

1. Tounderstand thebasics ofObject Oriented Programming concepts, Character Set,tokens,variables,datatypes,operatorsandcontrolstructure.
2. TounderstandthefundamentalconceptofJavalikeclassandobject,array,methods,construct orsandinheritance.
3. Tounderstandtheconceptofpackage,ExceptionHandlingandThreading.
4. TounderstandtheconceptsofAppletsandAWT.
5. TounderstandtheconceptsofJDBCconnectivity.

Course Outcomes (five outcomes for each units should be mentioned)

1. After   studied   unit-1,   the   student   will   be   able   to understandthebasicsofObjectOrientedProgrammingconcepts,CharacterSet,tokens,variable s,datatypes,operatorsandcontrolstructure

2. After   studied   unit-2,   the   student   will   be   able   to understandthefundamentalconceptofJavalikeclassandobject,array,methods,constructorsan dinheritance

3. After   studied   unit-3,   the   student   will   be   able   to understandtheconceptofpackage,ExceptionHandlingandThreading

4. After   studied   unit-4,   the   student   will   be   able   to understandtheconceptsofAppletsandAWT

5. After   studied   unit-5,   the   student   will   be   able   to understandtheconceptsofJDBCconnectivity.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT-I:BASICCONCEPTS **Teaching Hours: 15**

OOPandJava-
ObjectsandClasses,Encapsulation,Inheritance,Polymorphism,JavaLanguage,ThePrimaries
–CharacterSet,Tokens,Constants,Variables,OperatorsandExpressions, Library Methods,
Strings, I/O Streams, Formatting the Output values, ControlStatements–
If,Switch,While,Do-While-for.

UNIT-II:ARRAYSANDOOFEATURESTeaching Hours: 15

One,TwodimensionalArrays,Methods–
Generalform,invoking,methodoverloading,recursion,Classesandobjects–
Generalform,creation,constructors,constructoroverloading,copy   constructor,'this'
keyword, Staticmembers,finalizemethod,Inner classandanonymousclasses,Inheritance–
inheriting,abstractclassesandfinalclasses,Interfaces

   – structure,implementation,interfaceinheritance.

UNIT-III:PACKAGES,EXCEPTIONHANDLINGANDTHREADING

Packages–

PackageHierarchy,ImportStatement,HidingtheClasses,AccessControlModifiers,Exception

Handling–DefaultException–

UserDefinedExceptionHandling,ExceptionandErrorClasses,ThrowandThrows.Threading–

LifeCycle,CreatingandRunning,MethodsinThreadClass,PriorityThread,Synchronization,D

eadLock,InterThreadCommunication.

UNIT-IV:APPLETSANDAWTTeaching Hours: 15

Applets–LifeCycle,AppletClass,SyntaxofAppletTag,MethodsinGraphicsClass,Events,

Listeners, Event Handling Methods, Inheritance of Control Classes, Labels,

ButtonControl,CheckBoxControl,RadioButton,ChoiceControl,ListControl,ScrollBars,Lay

outs and Panel, Windows and Frames, Menus and Dialogs, Mouse Events and

Listeners,AdapterClassandInnerClass.

UNIT-V:JDBCTeaching Hours: 15

JDBC–

EstablishingConnection,CreatingTables,EnterData,TableUpdatingObtainingMetadata,Usi

ngTransactions.

Internal Assessment Methods: (The following items may be brought under test, seminar and
assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the
   course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can
   be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the
   colleges for practicing their theoretical study. Innovative methods may be implemented in

the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1.MuthuC,"ProgramminginJava",2ndEdition,TataMcgrawHillEducationPrivateLimited,2009.

Unit–I	:	Ch.1,2,3
Unit-II	:	Ch.4,5,6
Unit-III	:	Ch.7,12,13
Unit–IV	:	Ch.8,9,10
Unit–V	:	Ch.18

References

1. HerbertSchildt,"TheCompleteReference–Java2",4thEdition,TataMcGrawHill,2001.

2. Balaguruswamy,"ProgrammingwithJAVA",2ndEdition,TataMcGrawHill,1999.

Web References

OnlineTutorial

1. http://www.tutorialspoint.com/java/

2. http://javabeginnerstutorial.com/core-java/

OnlineQuiz

1. https://www.tutorialspoint.com/java/java_online_quiz.htm

2. http://withoutbook.com/OnlineTestStart.php?quizId=2

OnlineCompiler

1. https://www.codechef.com/ide

2. https://www.tutorialspoint.com/compile_java_online.php

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO2	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO3	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO4	S	S	S	M	M	S	L	S	S	M	M	S	M	L	S
CO5	S	S	S	M	M	S	L	S	S	M	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **II**   Paper type: **Core**   Paper code: **Paper - 5**Name of the Paper:**Relational Database Management System** Credit:**3**

Total Hours per Week:**5 Hours**Lecture Hours: 4   Tutorial Hours: 1   Practical Hours:-

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Course Objectives

1. TounderstandthebasicconceptsofDatabaseandDataModels.
2. Tounderstandtheconsequencesofbaddatabasedesignandhowitcanbeovercome.
3. Tolearnhowtoimplementthequerylanguageindatabase.
4. ToknowwhatistheroleofPL/SQLinRDBMS.
5. TohavethebasicknowledgeonNoSQL.

Course Outcomes (five outcomes for each units should be mentioned)

1. After   studied   unit-1,   the   student   will   be   able   to makethestudenttoknowaboutthedatabaseschemaandlearnthebasicterminologiesusedindatabase

2. After   studied   unit-2,   the   student   will   be   able toenablethestudenttolearnthelifecycleanddevelopmentofdatabasemanagementsystems.

3. After   studied   unit-3,   the   student   will   be   able   to facilitatethestudenttowriteSQLqueriestomanipulatedata

4. After   studied   unit-4,   the   student   will   be   able   to helpthestudenttolearnPL/SQLprogramming

5. After   studied   unit-5,   the   student   will   be   able   to makethestudenttoaccessdatabasewithoutquerylanguages

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	No	No
2	Yes	Yes	Yes	Yes	No	No

3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	No	No

UNIT–I:BASICCONCEPTSANDDATAMODELSTeaching Hours: 15

BasicConcepts:Datamodelingfordatabase-ThethreelevelarchitectureproposalforDBMS - Componentsof DBMS - Advantageand Disadvantage ofaDBMS. Data Models:DataModels Classification - Entity Relationship Model – Relational Data Model – Network DataModel- Hierarchical Model-Comparison.

UNIT–II:RELATIONALMODEL&RELATIONALDATABASEDESIGN

Teaching Hours: 15

Relational Model: Relational Database- Relational Algebra. Relational DatabaseDesign - Relational Scheme and Relational Design - Anomalies in Database- Universal Relation - FunctionalDependency-RelationalDependency-RelationalDatabaseDesign.

UNIT–III:SQLTeaching Hours: 15

BasicSQLSELECTstatements–TableCreationandmanagement–Constraints–Datamanipulation and Transaction Control – Additional database Objects - Group functions – SubQueries andMerge–Views–Formatted readable

UNIT–IV:PL/SQLTeaching Hours: 15

Introduction to PL/SQL – PL/SQL Essentials – Understanding PL/SQL Built-in functions – UnderstandingPL/SQLControlStructures–ImplementingSQLOperationsinPL/SQL– UnderstandingsubprogramsinPL/SQL.

UNIT–V:ALTERNATIVEDBMSTeaching Hours: 15

OverviewofNoSQL-NoSQLStorageTypes–StorageTypes–Multi-Storagetypedatabase

– Comparingthemodels.AdvantagesandDrawbacks–TransactionalApplication– ComputationalApplication–Web-ScaleApplication.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. BipinCDesai,"AnIntroductiontoDatabaseSystem",GalgotiaPublicationsPvtLtd,NewDelhi1999.

   Unit–I   :   Ch.1.1,1.4-1.6,2.3-2.4&2.6-2.9
   Unit–II   :   Ch.4.1-4.3,6.1–6.5

2. JoanCasteel"ORACLE10gSQL",GengageLearning,FifthEdition2010.

   Unit–III   :   Ch.2,3,4,5,6,12,13,14
   Unit–IV   :   Ch.1,2,3,4,5,8

3. GauravVaish,"GettingstartedwithNoSQL",PacktPublishingLtd,2013.

Unit–V : Ch.1,3,4

References

1. C.J.Date, "Introduction to DatabaseSystem",Vol 1,NarosaPublishing House,NewDelhi.
2. DatabaseSystems,S.K.Singh,ThirdEdition.2009.
3. DatabaseManagementSystems,Ramakrishnan.Gehrke,InternationalEdition.2003.
4. RajeshkharSunderraman,"Oracle8ProgrammingAPrimer,Addition",WesleyPublication,NewDelhi,2000.

Web References

OnlineTutorial

1. https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm
2. http://searchoracle.techtarget.com/tutorial/Learning-Guide-RDBMS-fundamentals

OnlineQuiz

1. https://www.quia.com/quiz/164512.html
2. https://www.wiziq.com/online-tests/22152-rdbms-concepts

OnlineCompiler

1. 1.https://www.tutorialspoint.com/execute_sql_online.php
2. https://kripken.github.io/sql.js/GUI/

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO2	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S

CO3	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO4	S	S	S	M	M	S	L	S	S	M	M	S	M	L	S
CO5	S	S	S	M	M	S	L	S	S	M	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **II**   Paper type: **Core**   Paper code: **Paper -6**

Name of the Paper:**Open Source Technologies**   Credit:**3**

Total Hours per Week:**5 Hours** Lecture Hours:4Tutorial Hours:1Practical Hours:-

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Course Objectives

1. To understandtheconceptsofPerl
2. To developtheapplicationsusingPerl
3. To understandthefeaturesofApache
4. TodevelopthedifferentapplicationsusingMySQL
5. To demonstratetheapplicationsusingPHP.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understandtheconceptsofPerl
2. After studied unit-2, the student will be able to developtheapplicationsusingPerl
3. After studied unit-3, the student will be able to understandthefeaturesofApache
4. After studied unit-4, the student will be able todevelopthedifferentapplicationsusingMySQL
5. After studied unit-5, the student will be able to demonstratetheapplicationsusingPHP.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes

5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT–I:BASICPERL Teaching Hours: 15

Introduction-ScalarData-ListsandArrays-Subroutines-InputandOutput-Hashes-
RegularExpressions-ControlStructures-PerlModules-FileTests

UNIT–II:ADVANCEDPERL Teaching Hours: 15

DirectoryOperations-StringsandSorting-SmartMatching-ProcessManagement-
AdvancedPerlTechniques

UNIT–III:APACHE   **Teaching Hours: 15**

Introduction - Apache Explained - Starting, Stopping, and Restarting Apache - Modifying
theDefaultConfiguration-SecuringApache-SetUserandGroup-
ConsiderAllowingAccesstoLocalDocumentation-Don'tAllowpublic_htmlWebsites-
Apachecontrolwithaccess.

UNIT–IV:MYSQLTeaching Hours: 15

Introduction to MY SQL - The Show Databases and Table - The USE command -
CreateDatabase and Tables - Describe Table - Select, Insert, Update, and Delete statement -
SomeAdministrativedetail-TableJoins-LoadingandDumpingaDatabase.

UNIT–V:PHPTeaching Hours: 15

AccessingPHP-CreatingaSampleApplication-EmbeddingPHPinHTML-
AddingDynamicContent-AccessingFormVariables-UnderstandingIdentifiers-
ExaminingVariable Types -Declaring and Using Constants - Understanding VariableScope -
UsingOperators-UnderstandingPrecedenceandAssociativity-UsingVariableFunctions-
MakingDecisionswithConditionals-RepeatingActionsThroughIteration.PHPvalidations
    -AccessingMySQLDatabasefromtheWebwithPHP.

Internal Assessment Methods: (The following items may be brought under test, seminar and
assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

UnitI&II

RandalL.Schwartz,TomPhoenix,briandfoy,"LearningPerl,FifthEditionMakingEasyThings EasyandHardThingsPossible",O'ReillyMedia,June2008

UnitIII&IV

JamesLeeandBrentWare,"OpenSourceWebDevelopmentwithLAMPusingLinux,Apache, MySQL,PerlandPHP",JamesLeeandBrentWare,DorlingKindersley(India),Pvt,Ltd,2008

UnitV

LukeWelling,LauraThomson"PHPandMySQLWebDevelopment"PearsonEducation,Inc., FourthEdition,2008

References

1. StevenD.Nowicki,AlecCove,HeowEide-goodman,"ProfessionalPHP",WroxPress,2004.

2. EricRosebrock,EricFilson,"SettingupLAMP:GettingLinux,Apache,MySQL,andPHPa ndworkingTogether",PublishedbyJohnWileyandSons,2004

Web References

OnlineTutorial

1. http://my.safaribooksonline.com/book/databases/mysql/020177061x

OnlineQuiz

1. http://www.w3schools.com/html/html_quiz.asp
2. http://www.realinformation.net/Apache_Server_Popquiz.htm
3. http://www.withoutbook.com/OnlineTestStart.php?quizId=31http://www.myphpq uiz.com/

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO2	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO3	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO4	S	S	S	M	M	S	L	S	S	M	M	S	M	L	S
CO5	S	S	S	M	M	S	L	S	S	M	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **II**   Paper type:**Practical**   Paper code: **Paper -4**

Name of the Paper:**Practical 4:Programming With Java** Credit:**2**

Total Hours per Week:**3 Hour** Lecture Hours: 0   Tutorial Hours:0Practical Hours:3

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Course Objectives

1. Tounderstand thebasics ofObject Oriented Programming concepts, Character Set,tokens,variables,datatypes,operatorsandcontrolstructure.

2. TounderstandthefundamentalconceptofJavalikeclassandobject,array,methods,constructorsandinheritance.

3. Tounderstandtheconceptofpackage,ExceptionHandlingandThreading.

4. TounderstandtheconceptsofAppletsandAWT.

5. TounderstandtheconceptsofJDBCconnectivity.

Course Outcomes (five outcomes for each units should be mentioned)

1. After   studied   unit-1,   the   student   will   be   able   to   understandthebasicsofObjectOrientedProgrammingconcepts,CharacterSet,tokens,variables,datatypes,operatorsandcontrolstructure

2. After   studied   unit-2,   the   student   will   be   able   to   understandthefundamentalconceptofJavalikeclassandobject,array,methods,constructorsandinheritance

3. After   studied   unit-3,   the   student   will   be   able   to   understandtheconceptofpackage,ExceptionHandlingandThreading

4. After   studied   unit-4,   the   student   will   be   able   to   understandtheconceptsofAppletsandAWT

5. After   studied   unit-5,   the   student   will   be   able   to   understandtheconceptsofJDBCconnectivity.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

1. ClassandObjects

2. StringandStringBufferClass

3. InheritanceandInterface

4. Packages

5. ExceptionHandling

6. Threads

7. Applet

8. Shapes

9. AWT

10. JDBC

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO2	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO3	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO4	S	S	S	M	M	S	L	S	S	M	M	S	M	L	S
CO5	S	S	S	M	M	S	L	S	S	M	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **II**   Paper type:**Practical**   Paper code: **Paper -5**

Name of the Paper:**Practical 5: Relational Database Management System**Credit:**2**

Total Hours per Week:**3 Hours**Lecture Hours:-Tutorial Hours:**-**Practical Hours:**3**

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Course Objectives

1. TounderstandthebasicconceptsofDatabaseandDataModels.
2. Tounderstandtheconsequencesofbaddatabasedesignandhowitcanbeovercome.
3. Tolearnhowtoimplementthequerylanguageindatabase.
4. ToknowwhatistheroleofPL/SQLinRDBMS.
5. TohavethebasicknowledgeonNoSQL.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to makethestudenttoknowaboutthedatabaseschemaandlearnthebasicterminologiesusedindatabase

2. After studied unit-2, the student will be able toenablethestudenttolearnthelifecycleanddevelopmentofdatabasemanagementsystems.

3. After studied unit-3, the student will be able to facilitatethestudenttowriteSQLqueriestomanipulatedata

4. After studied unit-4, the student will be able to helpthestudenttolearnPL/SQLprogramming

5. After studied unit-5, the student will be able to makethestudenttoaccessdatabasewithoutquerylanguages

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	No	No

2	Yes	Yes	Yes	Yes	No	No
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	No	No

SQL

1. DataDefinitionLanguage(Create,Alter,Drop,Rename)

2. DataManipulationLanguage(Insert,Update,Delete)

3. TransactionalControlLanguage(Commit,SavePoint,RollBack)

4. QueriesusingAggregateFunctions(Count,Sum,Avg,MaxandMin)

PL/SQL

5. Blocks

6. ExceptionHandling

7. Functions

8. Procedures

9. Cursors

10. Triggers

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO2	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S

CO3	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO4	S	S	S	M	M	S	L	S	S	M	M	S	M	L	S
CO5	S	S	S	M	M	S	L	S	S	M	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **II**   Paper type:**Practical**   Paper code: **Paper -6**

Name of the Paper: Practical 6:**Open Source Technologies**   Credit:**2**

Total Hours per Week:**3 Hours**Lecture Hours: -   Tutorial Hours:**-**Practical Hours: **3**

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Course Objectives

1. To understandtheconceptsofPerl
2. To developtheapplicationsusingPerl
3. To understandthefeaturesofApache
4. TodevelopthedifferentapplicationsusingMySQL
5. To demonstratetheapplicationsusingPHP.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understandtheconceptsofPerl
2. After studied unit-2, the student will be able to developtheapplicationsusingPerl
3. After studied unit-3, the student will be able to understandthefeaturesofApache
4. After   studied   unit-4,   the   student   will   be   able todevelopthedifferentapplicationsusingMySQL
5. After studied unit-5, the student will be able to demonstratetheapplicationsusingPHP.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

1.   Variables,ConstantsandOperators

2.   Conditionalstatements

3.   ControlStructures

4.   Functions

5.   CookiesandSession

6.   PredefinedVariables

7.   MySQLfunctions

8.   E-MailFunction

9.   FileOperationsandFileUploading

10.   DatabaseApplicationwithMYSQL

Mapping with Programme Outcomes

11.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO2	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO3	S	S	S	M	M	S	L	S	S	M	M	S	M	M	S
CO4	S	S	S	M	M	S	L	S	S	M	M	S	M	L	S
CO5	S	S	S	M	M	S	L	S	S	M	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **II**   Paper type:**Core Elective**   Paper code: **Paper -2**

Name of the Paper:**A:Operation Research** Credit:**3**

Total Hours per Week:**3 Hours**Lecture Hours:3Tutorial Hours:**-**Practical Hours:-

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Course Objectives

1. To know the linear programming models.
2. To expose the concept of transportation and assignment models.
3. To know the integer programming models.
4. To give knowledge about scheduling by PERT and CPM.
5. To impart the knowledge on Queuing models.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able know linear programming models

2. After studied unit-2, the student will be able to expose the concept of transportation and assignment models.

3. After studied unit-3, the student will be able to know the integer programming models.

4. After studied unit-4, the student will be able to understand the Scheduling concept by PERT and CPM.

5. After studied unit-5, the student will be able to impart the knowledge on Queuing models.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	No	No	No	No

4	Yes	Yes	No	No	No	No
5	Yes	Yes	No	No	No	No

UNIT – I: LINEAR PROGRAMMING MODELS Teaching Hours: 9

LinearProgrammingModels:MathematicalFormulation–Graphical Solutionoflinear
Programmingmodels–SimplexMethod-ArtificialVariableTechniques.

UNIT - II: TRANSPORTATION AND ASSIGNMENT MODELSTeaching Hours: 9

TransportationandAssignmentModels:-MethodsforfindinginitialBasicfeasiblesolution–
Optimumsolution-degeneracy-HungarianAlgorithm-VariantsoftheAssignmentProblem.

UNIT – III: INTEGER PROGRAMMING MODELSTeaching Hours: 9

IntegerProgrammingModels:Formulation-Gomory'sIPPMethod–
Gomory'smixedintegermethod.

UNIT – IV: PERT AND CPMTeaching Hours: 9

SchedulingbyPERTandCPM:NetworkConstruction-CriticalPathMethod–
ProjectEvaluationandReviewTechnique.

UNIT – V: QUEUING MODELS   Teaching Hours: 9

QueuingModels:CharacteristicsofQueuingModels–PoissonQueues-
$(M/M/1){:}(FIFO/\infty/\infty)$,$(M/M/1){:}$ $(FIFO/N/\infty)$models.

Internal Assessment Methods: (The following items may be brought under test, seminar and
assignment framework)

   a. Book review and research paper review, syllabus and curriculum review.
   b. Data collection and paper writing practices: books level, field study level. Using the
       course study for society and nature development – exercise
   c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. AtahaH.A,"OperationResearch:AnIntroduction",PearsonEducation,8/E**,**2006.

References

1. S.P.Gupta,"AnIntroductiontoOperationResearch",PearsonEducation,8/E,2006
2. R.Sivarethinamohan,"AnIntroductiontoOperationResearch",TMG,1/E,2006
3. P.K.Gupta,GandhiSwaroop,Manmohan,"ProbleminOperationResearch",SultanandChands,4/E,2004
4. P.R.VittalandMalini,"AnIntroductiontoOperationResearch",PearsonEducation,8/E,2006

Web References:

www.tutorialspoint.com/operationresearch/

www.indiabix.com/online-test/operationresearch.test/

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	S	S	M	M	M	M	M	L	M	M	S
CO2	S	S	M	M	S	S	M	M	M	M	M	L	M	M	S
CO3	S	S	M	M	S	S	M	M	M	M	M	L	M	M	S
CO4	S	S	M	M	S	S	M	M	L	M	M	L	M	M	S
CO5	S	S	M	M	S	S	M	M	L	M	M	L	M	M	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **II**   Paper type:**Core Elective**   Paper code: **Paper -2**

Name of the Paper:**B:Graph Theory**Credit:**3**

Total Hours per Week:**3 Hours**Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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Course Objectives

1. To understand the graph theory principles
2. To expose the concept of graph theory algorithms.
3. To understand the TraversibilityEulerian tours and Hamiltonian Cycles.
4. To gain the knowledge on Graph theory applications.
5. To impart the knowledge on graph searching algorithms.

Course Outcomes (five outcomes for each units should be mentioned)

1.   After   studied   unit-1,   the   student   will   be   able
UnderstandGraphtheoryprinciplesanditsapplications.

2. After studied unit-2, the student will be able tostudyofdifferentGraphtheoryalgorithms.

3. After studied unit-3, the student will be able tounderstand the TraversibilityEulerian tours and Hamiltonian Cycles.

4.   After   studied   unit-4,   the   student   will   be   able   to
gaintodeployGraphtheoryapplicationsusingasoftwaredevelopmentenvironment.

5.   After   studied   unit-5,   the   student   will   be   able
tostudyofdifferentGraphsearchingalgorithms.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes

2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

Unit–I:INTRODUCTION   **Teaching Hours: 9**

Fundamentalconcepts3232Basicdefinitions,operations,properties,proofstyles;Trees(properties,dis tancesandcentroids,spanningtrees,enumeration),Graphsanddigraphs,complement, isomorphism, connectedness   and   reachability,   adjacency   matrix,   Eulerian pathsandcircuitsingraphsanddigraphs,Hamiltonianpathsandcircuitsingraphsandtournaments

Unit–II: BIPARTITE GRAPHS   **Teaching Hours: 9**

MatchingsBipartitegraphs,generalgraphs,weightedmatching;Connectivity(vertexandedgeconnecti vity,cuts,blocks,k-
connectedgraphs,networkflows).trees;Minimumspanningtree,rootedtreesandbinarytrees,planargr aphs,Euler'sformula,statementofKuratowskey's theorem, dual of a planer graph, independence number   and   clique   number,chromaticnumber,statementofFour-
colortheorem,dominatingsetsandcoveringsets.

Unit–III:GRAPH PROBLEMS I   **Teaching Hours: 9**

TraversibilityEuleriantours,Hamiltoniancycles;Coloring(vertexandedgecoloring,chromatic number,chordalgraphs).

Unit–IV:GRAPH PROBLEMS II   **Teaching Hours: 9**

PlanarityDuality,Euler'sformula,characterization,4-
colortheorem;Advancedtopics(perfectgraphs,matroids,Ramsaytheory,extremalgraphs,randomgra

phs);Applications

Unit–V:GRAPH PROBLEMS AND APPLICATIONS   Teaching Hours: 9

GraphproblemsGraphsearching–
BFS,DFS,shortestfirstsearch,topologicalsort;connectedandbiconnectedcomponents;Minimumspa
nningtrees–Kruskal'sandPrim'salgorithms–
Johnson'simplementationofPrim'salgorithmusingpriorityqueuedatastructures.Algebraicproblems
:Evaluationofpolynomialswithorwithoutpreprocessing.Winograd'sandStrassen'smatrixmultiplica
tionalgorithmsandapplicationstorelatedproblems,FFT,simplelowerboundresults.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1.DouglasB.West,IntroductiontoGraphTheory,PrenticeHallofIndia,1996

References

1. A.Gibbons,AlgorithmicGraphTheory,CambridgeUniversityPress,1985.

2. NarsinghDeo, GraphTheory with Applications to Engineering andComputerScience.Prentice-Hall,2004

3. FrankHarary,GraphTheory,Narosa,1994.

4. R.Ahuja,T.Magnanti,andJ.Orlin,NetworkFlows:Theory,Algorithms,andApplications,Prentice-Hall,1988.

Web References

1. http://https://www.tutorialspoint.com/graphtheory/>

2. http://www.indiabix.com/online-test/graphtheory.test

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	S	S	M	M	M	M	M	L	M	M	S
CO2	S	S	M	M	S	S	M	M	M	M	M	L	M	M	S
CO3	S	S	M	M	S	S	M	M	M	M	M	L	M	M	S
CO4	S	S	M	M	S	S	M	M	L	M	M	L	M	M	S
CO5	S	S	M	M	S	S	M	M	L	M	M	L	M	M	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **II**   Paper type:**Core Elective**   Paper code: **Paper -2**

Name of the Paper:**C: Discrete Mathematics**   Credit:**3**

Total Hours per Week:**3 Hours**Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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Course Objectives

1. To know the basics of discrete mathematics.
2. To expose the concept of set theory.
3. To understand the knowledge on Logic.
4. To give knowledge about finite automata theory.
5. To impart the knowledge on finite automata and regular languages.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand thedifferenttechniquesofDiscrete Mathematics.

2. After studied unit-2, the student will be able torepresentrelationsinvariousways.Showwhetherarelationisofequivalence,ofpartialorderor neither

3. After studied unit-3, the student will be able tounderstand the knowledge on logic.

4. After studied unit-4, the student will be able torepresentthe knowledge about finite automata theory.

5. After studied unit-2, the student will be able toimpart the knowledge on finite automata and regular languages.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes

2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT-I: **Teaching Hours: 9**

Introduction – MatrixOperators – InverseofasquareMatrix Elementary Operations andRank of a Matrix – Simultaneous Equations Inverse by Partitioning - Eigen Values and EigenVectors.

UNIT–II: SET THEORY   **Teaching Hours: 9**

SetTheory:Introduction–Sets–NotionsandDescriptionofSets–Subsets–Venn–Diagram–OperationsonSets–PropertiesofSetOperations–VerificationoftheBasicLawsofAlgebraby VennDiagrams –TheprinciplesofDuality –Relations: Cartesian ProductofTwo Sets –Relations –Representation of a Relation –Operations –on Relation –EquivalenceRelations – Equivalence Relation – Closure and Wars hall's algorithm – One-to-one, OntoFunctions–SpecialTypesoffunctions–InvertibleFunctions–CompositionofFunctions

UNIT–III:LOGICTeaching Hours: 9

Logic:Introduction– TFStatement– Connectives–AtomicandCompound statements–Well Formed Formulae – Truth Table of a Formula –Tautology –Tautology Implications andEquivalence of Formulae –Replacement Process –Functionally Complete Sets of Connectivesand Duality Law – Normal Forms – Principles of Normal Forms –Theory of Inference –OpenStatement –Quantifiers – Valid Formulae and Equivalence –Theory of Inference for PredicateCalculus –StatementsinvolvingmorethanoneQuantifier.

UNIT–IV:FINITE AUTOMATA   **Teaching Hours: 9**

Finite Automata – Definition of Finite Automation – Representation of finite Automaton – AcceptabilityofaString byNon-DeterministicFiniteAutomata–EquivalenceofFAandNFA – Procedure for finding an FA equivalent to a given NFA –Properties of Regular Sets –

FiniteStateMachines –The monoid of aFinite NFA –Properties ofRegular Sets–
FiniteStateMachines–ThemonoidofaFiniteStateMachine–Machineofamonoid–
phraseStructuredGrammars.

UNIT–V:CHOMSKY HIERARCHY OF LANGUAGE   Teaching Hours: 9

Chomsky Hierarchy of Languages – Finite Automata and Regular Languages –
DerivationTrees; For Context-free Grammars –Normal Forms for Context-free grammars-
Acceptance,PolishNotation–SimplePrecedenceGrammar-PushdownAutomation–
InstantaneousDescriptionof a PDA- ImportantPropertiesofMoveRelation- AcceptancebyPDA
–EquivalenceoftwotypesofAcceptancebyPDA-Context-freeLanguagesandPDAs-

Internal Assessment Methods: (The following items may be brought under test, seminar and
assignment framework)

   a. Book review and research paper review, syllabus and curriculum review.
   b. Data collection and paper writing practices: books level, field study level. Using the
      course study for society and nature development – exercise
   c. Workshops, preparing technical term dictionaries from text books and reference books.
   d. Preparing question paper by the candidates: objective type, descriptive type, training can
      be given by the teacher
   e. Forming digital library: collecting text and reference books, course material.
   f. Villages, institutions, various people groups may be adopted by the departments of the
      colleges for practicing their theoretical study. Innovative methods may be implemented in
      the practices and report can be written for documentation, further discussion and
      research.
   g. Extracurricular and cultural activities may be framed through the syllabus content.
   h. Grouping students for self-discussion, self-learning process.
   i. Following institution and intellectual and writing reports in the course field.

 Text
  1. M.K.Venkatraman,Sridharan,N.Chandrasekaran–
     "DiscreteMathematics",NationalPublishingCompany,1/E,2000.

2. R.M.Somasundaram,"DiscreteMathematicalStructures",PHI,1/E,2003.

References

1. HopcraftandUllman,"IntroductiontoAutomataTheory,Languages&Computation",Pears onEducation,2/E,2006.

2. Tremblay andManohar, "Discrete Mathematicalstructures with applicationstocomputerscience",Tata McGraw-Hill,1/E,2007.

Web References

1. http://https://www.tutorialspoint.com/discretemathematics/

2. http://www.indiabix.com/online-test/discretemathematetics

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	S	S	M	M	M	M	M	L	M	M	S
CO2	S	S	M	M	S	S	M	M	M	M	M	L	M	M	S
CO3	S	S	M	M	S	S	M	M	M	M	M	L	M	M	S
CO4	S	S	M	M	S	S	M	M	L	M	M	L	M	M	S
CO5	S	S	M	M	S	S	M	M	L	M	M	L	M	M	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **II**   Paper type:**Open Elective**   Paper code: **Paper -2**

Name of the Paper:**A: Problem Solving Techniques**   Credit:**3**

Total Hours per Week:**3 Hours**Lecture Hours: 3   Tutorial Hours:**-**   Practical Hours:**-**

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Course Objectives

1. Todevelopproblemsolvingskillswithtopdowndesignprinciples.

2. Tobecomecompetentinalgorithmdesignandprogramimplementation.

3. Todevelopskillstoapplyappropriatestandardmethodsinproblemsolving

4. Todevelopskillstoapplyappropriatestandardmethodsinproblemsolving   with   array
    techniques.

5. Todevelopskillstoapplyappropriatestandardmethodsinmerging, sorting and searching.

Course Outcomes (five outcomes for each units should be mentioned)

1. After   studied   unit-1,   the   student   will   be   able   to
    developprogrammingtechniquesrequiredtosolveagivenproblem.

2. After studied unit-2, the student will be able todevelopproblemsolvingskillusingtop–
    downdesignprinciples.

3. After studied unit-3, the student will be able to analgorithmforaproblem.

4. After   studied   unit-4,   the   student   will   be   able   to
    developtechniquestohandlearraystructure.

5. After   studied   unit-5,   the   student   will   be   able   to
    developtechniquessuchassearchingandsorting.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	No	No	No	No
2	Yes	Yes	Yes	Yes	Yes	Yes

3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT-I:PROGRAMMINGTECHNIQUESTeaching Hours: 9

StepsInvolvedinComputerProgramming–ProblemDefinition–OutliningTheSolution–
FlowChart–DevelopingAlgorithms–EfficiencyofAlgorithms-AnalysisofAlgorithms.

UNIT–II:FUNDAMENTALALGORITHMSTeaching Hours: 9

Exchanging the Values – Counting – Summation of Set of Number – Factorial Computation –
SineComputation–FibonacciSequence–ReversingtheDigitsofanInteger–BaseConversion–
CharactertoNumber Conversion.

UNIT–III:FACTORINGMETHODS   Teaching Hours: 9

FindingtheSquareRootofaNumber–SmallestDivisorofanInteger–GCDofTwoIntegers–
GeneratingPrimeNumbers–ComputingthePrimeFactorsofanInteger–Generation of Pseudo-
Random   Numbers   –   Raising   aNumber   to   aLarge   Power   –
ComputingtheNthFibonacciNumber.

UNIT–IV:ARRAYTECHNIQUES   Teaching Hours: 9

ArrayOrderReversal–ArrayCountingOrHistogramming–FindingtheMaximumNumberinaSet–
RemovalofDuplicatesfromanOrderedArray–PartitioninganArray–
FindingThekthSmallestElement–LongestMonotoneSubsequence.

UNIT–V:MERGING,SORTINGANDSEARCHING   Teaching Hours: 9

Two Way Merge - Sorting by Selection, Exchange, Insertion, Partitioning - Binary Search –
HashSearching.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. DromeyRG,"HowtoSolveitbyComputer",PrenticeHallofIndia,1997

References

1. MichaelSchneider,StevenW.Weingart,DavidM.Perlman,"AnIntroductiontoProgram mingandProblemSolvingwithPascal",WileyEasternLimited,NewDelhi,1982.

2. HaroldAbelsonandGeraldSussmanwithJulieSussman,"StructureandInterpretationo fComputerPrograms",MITPress,1985.

Web References:

1. http://nptel.ac.in/courses/106104074/

2. http://javahungry.blogspot.com/2014/06/algorithm-problem-solving-techniques-or-approaches-for-software-programmer.html

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **II**   Paper type:**Open Elective**   Paper code: **Paper -2**

Name of the Paper:**B: Open Source Software**   Credit:**3**

Total Hours per Week:**3 Hours**Lecture Hours: 3   Tutorial Hours:**-**   Practical Hours:**-**

Course Objectives

1. TounderstandthefeaturesofPHP
2. TodemonstratetheapplicationsusingPHPwithMysql.
3. To develop applications using PHP with Ajax.
4. TounderstandtheconceptsofPerl
5. TodeveloptheapplicationsusingPerl

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understandthefeaturesofPHP.
2. After   studied   unit-2,   the   student   will   be   able todevelopthedifferentapplicationsusingPHP with Mysql
3. After   studied   unit-3,   the   student   will   be   able   to demonstratetheapplicationsusingPHPwithAjax.
4. After studied unit-4, the student will be able to understandtheconceptsofPerl.
5. After studied unit-5, the student will be able to DeveloptheapplicationsusingPerl

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes

5	Yes	Yes	Yes	Yes	Yes	Yes

Unit-I:BASICPHP   **Teaching Hours: 9**

WebServer-Apache-PHP-DataTypes-UserdefinedVariables-Constants-Operators-
ControlStructures-UserdefinedFunctions-DirectoryFunctions-FilesystemFunctions-Arrays-
StringFunctions-DateandTimeFunctions-MathematicalFunctions-MiscellaneousFunctions

UNIT-II:ADVANCEDPHPWITHMYSQL   **Teaching Hours: 9**

Exceptionshandling-ErrorHandlingFunctions-PredefinedVariables-Cookies-Sessions-COM-
DOM-CURL-SOAP-ClassesandObjects-MailFunction-
URLFunctions.PHPwithMySQL:PHPMySQLFunctions-Databasedrivenapplication.

UNIT-III:ADVANCEDPHPWITHAJAX,SEOANDCMSPHPWITHAJAX

Teaching Hours: 9

Introducing Ajax-Ajax Basics-PHP and Ajax-Database Driven Ajax. PHP with SEO:
BasicSEO-Provocative SE Friendly URLs-Duplicate Content- CMS: Wordpress Creating an
SE-FriendlyBlog.

UNIT-IV:BASICPERL   **Teaching Hours: 9**

Introduction-ScalarData-ListsandArrays-Subroutines-InputandOutput-Hashes-
RegularExpressions-ControlStructures-PerlModules-FileTests

UNITV:ADVANCEDPERL   **Teaching Hours: 9**

Directory Operations-Strings and Sorting-Smart Matching-Process Management-
AdvancedPerlTechniques

Internal Assessment Methods: (The following items may be brought under test, seminar and
assignment framework)

   a.   Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

Unit1&2

MehdiAchour,Friedhelm,BetzAntony Dovgal,NunoLopes,Hannes Magnusson,GeorgRichter,DamienSeguy,JakubVranaAndseveralothers,"PHPManual(Downloadthemanualfrom PHPofficialwebsitewww.php.net)",1997-2011thePHPDocumentationGroup.

Unit3

LeeBabin,"BeginningAjaxwithPHPFromNovicetoProfessional",Apress,2007(Chapters1,2,3and4)JaimieSirovichandCristianDarie,"ProfessionalSearchEngine OptimizationwithPHP

ADeveloper'sGuidetoSEO",WileyPublishing,Inc.,Indianapolis,Indiana,2007 (Chapters2,3,5and16)

Unit4&5

RandalL.Schwartz,TomPhoenix,briandfoy,"LearningPerl,FifthEditionMakingEasyThings EasyandHardThingsPossible",O'ReillyMedia,June2008

References

1. StevenD.Nowicki,AlecCove,HeowEide-goodman,"ProfessionalPHP",

WroxPr

ess,2004.

Web References

1. www.php.netwww.phpclasses.org

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **II**   Paper type:**Open Elective**   Paper code: **Paper -2**

Name of the Paper:**C: Principles of Web Design**   Credit:**3**

Total Hours per Week:**3 Hours**Lecture Hours:3Tutorial Hours:-   Practical Hours:-

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Course Objectives

1. To provide a comprehensive overview of the largest Web Technologies Hyper TextMarkupLanguages(HTML)andCascadingStyleSheet(CSS).
2. To give knowledge on HTML tags.
3. To learn HTML frame and form tags.
4. Tolearnthroughhands-on,practicalinstructionthatwillassistthestudentstotacklethereal-worldproblems they faceinbuilding websitestoday—withaspecific focusonHTML5and CSS3.
5. To implement CSS in web pages.

Course Outcomes (five outcomes for each units should be mentioned)

1. After   studied   unit-1,   the   student   will   be   able   to learnhowtocombinebasicHTMLelementstocreateWebpages.
2. After studied unit-2, the student will be able tounderstandtheuseofHTMLimage, link and table tags.
3. After studied unit-3, the student will be able to capabletolearnabout frames and forms tags.
4. After studied unit-4, the student will be able to gainagoodunderstandingofusingCSS.
5. After   studied   unit-5,   the   student   will   be   able   to controlappearancewebpagesbyapplyingstylesheet.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT-I:HTMLINTRODUCTION   Teaching Hours: 9

Web page: Static & Dynamic Page - Web Browsers - HTML Editors - Tags – Elements –
Attributes -HTML Page Structure - HTML Basic tags: Head – Title – Body. Basic
textformatting:Headingtags–Paragraphtag–hrtag-Linebreak–
Preformatted.PresentationalElement-PhraseElements.ListTags:OrderedList–UnorderedList–
DefinitionList.

UNIT–II:LINKS,IMAGESANDTABLES   Teaching Hours: 9

Link: Basiclink– Directories and directory structure – creating links.Imageand
Object:Addingimagetoyoursite–Addingotherobjects–Usingimageaslinks.
Tables:Basictableelementsandattributes–Advancedtable–Accessibilityissueswithtables.

UNIT–III:FRAMESANDFORMS   Teaching Hours: 9

Frames:TheFrameset,NoFrameElement-CreatingLinkbetweenFrames-NestedFrameset.
Form:Text Fields - Password Field - Radio Button – Checkbox - Submit Button –ResetButton
–Button– Select –option–text area.

UNIT–IV:CASCADINGSTYLESHEET-I   Teaching Hours: 9

Introduction–syntax–IDselector-Classselector–ExternalCSS–InternalCSS–InlineCSS   –Font
property: Font family -font size – font weight -font style -font variant -fontstretch-
fontsizeadjust.TextFormatting:Color,text-align,vertical-align,decoration–indent-   shadow   –

transform- letter spacing –word pacing- white space - direction. Text PseudoClasses:First-letterpseudoclass-Firstlinepseudoclass.

UNIT-V:CASCADINGSTYLESHEET-II   **Teaching Hours: 9**

Background: color – image – repeat – position – attachment. List: style type – style position – style image – marker offset. Table: table specific – border collapse – border spacing – captionside – empty cell – table layout. Outlines: outline width – outline style – outline color. The:focusand: activepseudoclasses.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1.JonDucktt."WebProgrammingwithHTML,CSSandJAVASCRIPT",WileyPublishing, 2005. Unit – I: Ch.1   Unit – II: Ch. 2, 3 & 4 Unit - III: Ch.5, 6 Unit – IV: Ch.7Unit-V:Ch.8

References

1. JoelSkylar."PrinciplesofWebDesign".Singapore:ThomsonAsiaPvt.Ltd2000

2. Powell,ThomasA."WebDesign–
   TheCompleteReference",TataMcGrawHillEdition2000

3. AlexisGoldstein,LouisLazaris,EstelleWeyl."HTML5&CSS3fortheRealWorld".

WebReferences

1. http://www.w3schools.com/css

2. http://www.tutorialspoint.com/css

Matching Table (Mark tick symbol in the appropriate box)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **III** Paper type: **Core** Paper code: **Paper -7**Name
of the Paper:**Advance Java Programming** Credit:**3**
Total Hours per Week:**5 Hours**Lecture Hours: 4Tutorial Hours:**1**Practical Hours:**-**

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Course Objectives

1. To introduce programming with Applet and AWT.
2. An overview of database access and details for managing information using the JDBC API.
3. Examine the use of networking and collections.
4. Learn how to program Servlet and JSP.
5. To understand the web programming concepts in the perspective of Client and Server.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to develop Applet Programming using various techniques
2. After studied unit-2, the student will be able todevelop applications using Abstract Window Toolkit and Events
3. After studied unit-3, the student will be able to update and retrieve the data from the databases using JDBC-ODBC
4. After studied unit-4, the student will be able to develop server side programs in the form of Servlets
5. After studied unit-5, the student will be able to build up Java Applications using collections and JSP Tags.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT -I: APPLETS AND GUI   Teaching Hours: 15

Applet Fundamentals- Applet Class - Applet lifecycle- Steps for Developing Applet Programs- Passing Values through Parameters- Graphics in Applets; GUI Application - Dialog Boxes - Creating Windows - Layout Managers – AWT Component classes – Swing component classes- Borders – Event handling with AWT components - AWT Graphics classes - File Choosers - Color Choosers – Tree – Table –Tabbed panels–Progressive bar - Sliders.

UNIT- II: JDBC AND JAVA NETWORKINGTeaching Hours: 15

JDBC -Introduction - JDBC Architecture - JDBC Classes and Interfaces – Database Access with MySQL -Steps in Developing JDBC application - Creating a New Database and Table with JDBC - Working with Database Metadata; Java NetworkingBasics of Networking - Networking in Java- Socket Program using TCP/IP - Socket Program using UDP- URL and Inetaddressclasses.

UNIT- III: COLLECTIONS AND DESIGN PATTERNSTeaching Hours: 15

Collection Framework - ArrayList class - LinkedList class - ArrayListvs Linked List - ListIterator interface - HashSet class, LinkedHashSet class, TreeSet class PriorityQueue class - Map interface, HashMap class, LinkedHashMapclass ,TreeMap class - Comparable interface , Comparator interface, Comparable vs Comparator; Design Patterns: Introduction to Design patterns - Catalogue for Design Pattern - Factory Method Pattern, Prototype Pattern, Singleton

Pattern, Adapter Pattern, Proxy Pattern, Decorator Pattern, Command Pattern, Template Pattern, Mediator Pattern;

UNIT -IV: SERVLET AND JSPTeaching Hours: 15

Servlet: Advantages over Applets - Servlet Alternatives - Servlet Strengths - Servlet Architecture - Servlet Life Cycle – GenericServlet, HttpServlet - First Servlet - Invoking Servlet - Passing Parameters to Servlets - Retrieving Parameters - Server-Side Include – Cookies; JSP : JSP Engines Working with JSP - JSP and Servlet - Anatomy of a JSP Page.

UNIT -V: WEB PROGRAMMINGTeaching Hours: 15

Client-Side Programming: Client-side programming technologies - Form design using HTML, XHTML and DHTML and CSS - Client side validation Using JavaScript - Content Structuring using XML - Adding Interactivity with AJAX -JQuery Framework;

Server-side Programming: Web Servers - Handling request and response - Handling Form data - Session management - Database Access.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

    i.   Following institution and intellectual and writing reports in the course field.

Text

1. S. Sagayaraj, R. Denis, P.Karthik& D. Gajalakshmi "Java Programming", Universities Press, 2018.

References

1. Patrick Naughton& Herbert Schildt, "The Complete Reference: Java 2", Tata McGraw Hill, 1999.
2. Deitel&Deitel, "Java How to Program", Prentice Hall, 5th Edition, 2002
3. Peter Haggar, "Practical Java: Programming Language Guide", Addison-Wesley Pub Co, 1st Edition, 2000.
4. C.Muthu, "Programming with Java", McGraw Hill, Second Edition, 2008

Web References

1. http://math.hws.edu/javanotes/c6/index.html
2. http://www.tutorialspoint.com/awt/
3. www.studytonight.com
4. www.javatpoint.com
5. www.learnjavaonline.org
6. www.codingbat.com

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **III**   Paper type: **Core**   Paper code: **Paper -8**Name of the

Paper:**Unix and Shell Programming**   Credit:**3**

Total Hours per Week:**5 Hours**Lecture Hours: 4   Tutorial Hours: 1   Practical Hours:**-**

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Course Objectives

1. To learn to add and remove users.
2. To understand basic UNIX commands.
3. To use controls structures.
4. To understand loop structures.
5. To understand System calls.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to learn to add and remove users.
2. After studied unit-2, the student will be able tounderstand basic UNIX commands.
3. After studied unit-3, the student will be able to use controls structures.
4. After studied unit-4, the student will be able to understand loop structures.
5. After studied unit-5, the student will be able understand System calls.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating

1	Yes	Yes	No	No	No	No
2	Yes	Yes	No	No	No	No
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT – I : FILE ORGANIZATION   **Teaching Hours: 15**

Salient Features of Unix – Unix System Organization – Types of Shells – Unix Commands – The Unix File System – Creating Files – Listing Files and Directories. - The Boot Block – The Super Block – The Inode Table – Data Blocks – How Does Unix Access Files – Storage of Files – Disk Related Commands. System Administration: Adding and Removing Users – Daily Administration – Disk Management – Using a Raw Disk – Monitoring System Usage – Ensuring System Security – Providing Assistance to Users.

UNIT - II: UNIX COMMANDS   **Teaching Hours: 15**

Password – Commands: cal, banner, touch – File Related Commands – Viewing Files – Taking Printouts – File Compression – I/O Redirection and Piping. vi Editor – Modes of operation – The First Editing Session. Processes in Unix: What's Running Right Now – Still More Processes – Background Processes – The nohup command – Killing a process – Changing Process Priorities – Scheduling of Processes, Communication – Unix write and wall command - Basis of Unix Communication.

UNIT - III: SHELL PROGRAMMING - I   **Teaching Hours: 15**

Interactive Shell Scripts – Shell Variables – Shell Keywords –Assigning Values to Variables – Positional Parameters – Passing Command Line Arguments – Setting Values of Positional Parameters – Displaying Date in Desired Format – Using Shift on Positional Parameters – Arithmetic in Shell Script- Taking Decisions.

UNIT - IV SHELL PROGRAMMING - II   **Teaching Hours: 15**

Loop Control Structure: Loops – The While Loop – Reading from a file – The Until and for Loop – Creating Nested Directories – Generating Values for a for Loop – The Break and Continue Statement- Shell script using Command Line Arguments

UNIT - V: SYSTEM CALLS   **Teaching Hours: 15**

System calls: File Structure related calls - create(), open(), close(), read(), write(), lseek(), process related calls- exec(), fork(), wait(), exit(), getpid(), getppid(), signal(), kill(), alarm() – Inter process communication calls– pipe().

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

   a. Book review and research paper review, syllabus and curriculum review.

   b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

   c. Workshops, preparing technical term dictionaries from text books and reference books.

   d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

   e. Forming digital library: collecting text and reference books, course material.

   f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

   g. Extracurricular and cultural activities may be framed through the syllabus content.

   h. Grouping students for self-discussion, self-learning process.

   i. Following institution and intellectual and writing reports in the course field.

Text

> 1.YashavantKanetkar, "Unix Shell Programming", BPB Publishers, New Delhi, 1996.

> **Unit – I   :   Ch. 1, 2, 3, 15**
> **Unit – II   :   Ch. 4, 5, 6, 7, 8**
> **Unit – III :   Ch. 9 - 10**

Unit – IV :   **Ch. 11**

Unit-V   **:**   **http://www.cs.utk.edu/~huangj/cs360/360/notes/Syscall Intro/lecture.html**

References

1. Kernighan. et al. "The UNIX Programming Environment", Second Edition, New Delhi: Prentice Hall of the India, 1988.

2. Stephen G. Kochan, Patrick Wood, "Unix Shell Programming", Third Edition, Dorling Kindersley Pvt Ltd, Delhi, 2008.

Web References

Online Tutorial

1. http://www.cgl.ucsf.edu/Outreach/bmi219/slides/shell.html
2. http://www.cs.utk.edu/~huangj/cs360/360/notes/Syscall-Intro/lecture.html

Online Quiz

1. www.tcyonline.com/tests/unix-and-shell-scripts

Online Compiler

1. *www.compileonline.com/execute_bash_online.php*

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **III**   Paper type: **Core**   Paper code: **Paper -9**Name of the Paper:**Desktop Applications Using C#**   Credit:3

Total Hours per Week:**5 Hours**Lecture Hours: 4   Tutorial Hours:1Practical Hours:-

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Course Objectives

1. To know the differences between desktop and web application.
2. To construct classes, methods, and accessor and instantiate objects.
3. To create and manipulate GUI components in C#.
4. To code solutions and compile C# projects within the .NET framework.
5. To build own desktop application with Database

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to the differences between desktop application and web application.
2. After studied unit-2, the student will be able toconstruct classes, methods, and access modifier and instantiate objects.
3. After studied unit-3, the student will be able to create and manipulate GUI components in C# for windows application.
4. After studied unit-4, the student will be able to code solutions and compile C# projects within the .NET framework using reflection and remoting.
5. After studied unit-5, the student will be able to build the desktop application with Database.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT – I :INTRODUCTION TO C#   **Teaching Hours: 15**

Introduction to .NET – Features of C# - Data Types – Value Types – Reference Types - Variables and Constants – Declaring – Assigning values – variables of nullable types – Operators – Type Conversions – Implicit and Explicit Type Conversions – Arrays – Single Dimensional and Multidimensional – Control Flow Statements – Selection – Iteration and Jump – Classes and Objects – Access Modifiers – Defining a Class – Variables – Properties and Methods – Creating Objects – Inheritance – Polymorphism- Constructor and Destructors.

UNIT - II: WINDOWS FORMS   **Teaching Hours: 15**

Windows Forms – Form Class – Common Operations on Forms – Creating a Message Box – Handling Events – Mouse Events – Keyboard Events – Common Controls in Windows Forms – Label – TextBox – Button – Combo Box – List Box – Check Box – Radio Button – Group Box – Picture Box – Timer – Open File Dialog – Save File Dialog – Font Dialog – Color Dialog – Print Dialog – Tree View – Menu.

UNIT - III: DELEGATES AND EVENTSTeaching Hours: 15

Delegates – Declaring a Delegate – Defining Delegate Methods – Creating and Invoking Delegate Objects – Multicasting with Delegates – Events – Event Sources – Event Handlers – Events and Delegates.

UNIT - IV: REFLECTION AND REMOTING   **Teaching Hours: 15**

Life Cycle of threads-Using Reflection – Reflecting the Members of a Class - Dynamic Loading and Reflection - .NET Remoting – Architecture – Hosting of Objects – Single Ton and Single Call – Remoting Server – Remoting Client.

UNIT - V: DATABASE   **Teaching Hours: 15**

Creating Connection String – Creating a Connection to a Database – Creating a Command Object – Working with Data Adapters – Using Data Reader to work with Databases – Using Dataset.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.
b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise
c. Workshops, preparing technical term dictionaries from text books and reference books.
d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher
e. Forming digital library: collecting text and reference books, course material.
f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.
g. Extracurricular and cultural activities may be framed through the syllabus content.
h. Grouping students for self-discussion, self-learning process.
i. Following institution and intellectual and writing reports in the course field.

Text

1. Vikas Gupta , "Comdex .NET Programming " , Dream Tech Press, New Delhi, 2011
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Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **III**   Paper type:**Practical**   Paper code: **Paper -7**Name of the
Paper:**Practical7 : Advance Java Programming**Credit:**2**

Total Hours per Week:**3 Hours**   Lecture Hours:-   Tutorial Hours:-   Practical Hours:3

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Course Objectives

1. To introduce programming with Applet and AWT.
2. An overview of database access and details for managing information using the JDBC API.
3. Examine the use of networking and collections.
4. Learn how to program Servlet and JSP.
5. To understand the web programming concepts in the perspective of Client and Server.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to develop Applet Programming using various techniques
2. After studied unit-2, the student will be able todevelop applications using Abstract Window Toolkit and Events
3. After studied unit-3, the student will be able to update and retrieve the data from the databases using JDBC-ODBC
4. After studied unit-4, the student will be able to develop server side programs in the form of Servlets
5. After studied unit-5, the student will be able to build up Java Applications using collections and JSP Tags.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes

2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

1. Develop Applet Programming with various techniques.

2. Develop applications using AWT.

3. Working with Graphics ,Color and Font

4. Working with JDBC Classes(Database Operations- Create, Insert, Delete, Update, Select)

5. Handling ResultSet and Statements.

6. Jasper Report Generation

7. Working with Servlet and JDBC

8. Handling Client/Server Networking

9. Develop Java Server Pages applications using JSP Tags.

10. Working with Java Collections.

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **III**   Paper type:**Practical**   Paper code: **Paper -8**Name of the

Paper:**Practical 8: Unix and Shell Programming**Credit:**2**

Total Hours per Week:**3 Hours**Lecture Hours:-Tutorial Hours:**-**Practical Hours: 3

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Course Objectives

1. To learn to add and remove users.
2. To understand basic UNIX commands.
3. To use controls structures.
4. To understand loop structures.
5. To understand System calls.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to learn to add and remove users.
2. After studied unit-2, the student will be able tounderstand basic UNIX commands.
3. After studied unit-3, the student will be able to use controls structures.
4. After studied unit-4, the student will be able to understand loop structures.
5. After studied unit-5, the student will be able understand System calls.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	No	No	No	No
2	Yes	Yes	No	No	No	No
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

Programming with Shell Script

1. Shell Script – sequential structure
2. Shell Script – Iterative control structure
3. Shell Script – Strings
4. Shell Script – Files
5. Shell Script – Command Line Arguments

System Calls

6. Printing the command line arguments
7. Read(), write(), open(), creat()
8. Execlp(), execvp(), perror(),
9. Use of fork(), wait() & exit()
10. Child process, generated interrupt &lseek()

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **III**   Paper type:**Practical**   Paper code: **Paper -9**Name of the Paper:**Practical 9: Desktop Applications Using C#**Credit:**2**

Total Hours per Week:**3 Hour** Lecture Hours:-Tutorial Hours:**-**   Practical Hours:**3**

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Course Objectives

1. To know the differences between desktop and web application.
2. To construct classes, methods, and accessor and instantiate objects.
3. To create and manipulate GUI components in C#.
4. To code solutions and compile C# projects within the .NET framework.
5. To build own desktop application with Database

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to the differences between desktop application and web application.
2. After studied unit-2, the student will be able toconstruct classes, methods, and access modifier and instantiate objects.
3. After studied unit-3, the student will be able to create and manipulate GUI components in C# for windows application.
4. After studied unit-4, the student will be able to code solutions and compile C# projects within the .NET framework using reflection and remoting.
5. **After studied unit-5, the student will be able to build the desktop application with Database.**

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes

3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

1. Variables, Constants and Arrays

2. Classes and Objects

3. Inheritance

4. Polymorphism

5. Windows Form Controls (Label, Text, Button, Check Box, Radio)

6. Windows Form Controls (List, Combo, Timer, Group Box, Picture Box)

7. Menu Handling

8. Reflection

9. ADO.NET Connection

10. Data Command

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	**S**	**S**	**S**	M	M	**S**	M	M	M	L	M	**S**	M	L	**S**
CO2	**S**	**S**	**S**	M	M	**S**	M	M	M	L	M	**S**	M	L	**S**
CO3	**S**	**S**	**S**	M	M	**S**	M	M	M	L	M	**S**	M	L	**S**
CO4	**S**	**S**	**S**	M	M	**S**	M	M	M	L	M	**S**	M	L	**S**
CO5	**S**	**S**	**S**	M	M	**S**	M	M	M	L	M	**S**	M	L	**S**

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **III**   Paper type:**Core Elective**   Paper code: **Paper -3**Name
of the Paper:**Core Elective A:Software testing**Credit:**3**
Total Hours per Week:**3 Hours**Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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Course Objectives

1. To know the basic structure for testing teams.
2. To expose the concept of test automation and test metrics.
3. To know the different types of testing such as White Box, Black Box and Integration Testing.
4. To understand the different types of testing such as System, performance and regression testing.
5. To learn the different types of testing such as internalization and ad-hoc testing.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able know the basic structure for testing teams.
2. After studied unit-2, the student will be able to expose the concept of test automation and test metrics.
3. After studied unit-3, the student will be able to know the different types of testing such as White Box, Black Box and Integration Testing.
4. After studied unit-4, the student will be able to know the different types of testing such as System, performance and regression testing.
5. After studied unit-5, the student will be able to know the different types of testing such as internalization and ad-hoc testing.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating

1	Yes	Yes	Yes	Yes	No	No
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	No	No
5	Yes	Yes	Yes	Yes	No	No

UNIT – I: STRUCTURE FOR TESTING TEAMS AND TEST MANAGEMENT
Teaching Hours: 15

Dimensions of Organization Structures: Structures in Single-Product Companies-Structures for Multi-Product Companies- Effects of Globalization and Geographically Distributed Teams on Product Testing-Testing Services Organizations-Test Management: Test Planning-Test Process-Test Reporting.

UNIT - II: SOFTWARE TEST AUTOMATION AND TEST METRICS
Teaching Hours: 15

Test Automation-Scope of Automation-Design and Architecture of Automation-Process Model for Automation-Selecting a Test Tool -Challenges in Automation-Test Metrics: Types of Metrics-Project Metrics-Progress Metrics-Productivity Metrics.

UNIT – III: WHITE BOX, BLACK BOX AND INTEGRATION TESTING
Teaching Hours: 15

White Box Testing: Static Testing Structural Testing-Challenges in White Box Testing-Black Box Testing-Integration Testing: Types of Testing-Scenario Testing-Defect Bash.

UNIT – IV: SYSTEM, PERFORMANCE AND REGRESSION TESTING
Teaching Hours: 15

System Testing: Functional System Testing-Non-Functional Testing-Acceptance Testing-Methodologies for Performance Testing –Tools for Performance Testing -Process for Performance Testing –Regression testing.

UNIT – V: INTERNATIONALIZATION AND AD HOC TESTING

Teaching Hours: 15

Introduction-Primer on Internationalization-Enabling Testing-Local Testing-Language Testing-Localization Testing-Tools used for Internationalization-Ad hoc Testing: Pair Testing-Exploratory Testing-Iterative Testing-Agile and Extreme Testing. Software Testing Tools: WinRunner – Silk Test

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. SrinivasanDesikan and Gopalaswamy Ramesh, "Software Testing – Principles and Practices", Pearson education, 2006. (latest edition)

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1. Boris Beizer, "Software Testing Techniques" Second Edition, Dreamtech Press, New Delhi,2013.
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3. K.Mustafa and R.A.Khan, "Software Testing-Concepts and Practices",Narosa Publishing House,New Delhi,2012.
4. William Perry, "Effective Methods for Software Testing", Wiley, New Delhi, 2009.
5. Mark C Paulk, Charles V Weber and Mary B Chrissis, "The Capability Maturity Model", Carnegie Mellon University, Pennsylvania, 2004.
6. John Watkins, "Agile Testing : How to succeed in an extreme Testing environment", Cambridge Press, Cambridge, 2009

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2. http://withoutbook.com/OnlineTestStart.php?quizId=53
3. http://www.careerride.com/software-testing-quiz.aspx
4. http://en.wikipedia.org/wiki/HP_WinRunner

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **III**   Paper type:**Core Elective**   Paper code: **Paper -3**Name
of the Paper:**Core Elective B:Software Project Management**   Credit:**3**
Total Hours per Week:**3 Hours**Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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Course Objectives

1. Tolearn the basic of software project management
2. To understand the activities during the project planning and scheduling of any software application.
3. To apply the software estimation and recent quality standards for evaluation of the software Projects.
4. Tolearn the risk management activities and the resource allocation for the projects.
5. To acquire knowledge and skills needed for the construction of highly reliable software project with team spirit.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able tolearn the basic of software project management
2. After studied unit-2, the student will be able to know and understand the activities during the project planning and scheduling of any software application.
3. After studied unit-3, the student will be able to apply the software estimation and recent quality standards for evaluation of the software projects.
4. After studied unit-4, the student will be able tolearn the risk management activities and the resource allocation for the projects.
5. After studied unit-5, the student will be able to acquire knowledge and skills needed for the construction of highly reliable software project with team spirit.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	No	No	No	No
2	Yes	Yes	No	No	No	No
3	Yes	Yes	No	No	No	No
4	Yes	Yes	No	No	No	No
5	Yes	Yes	No	No	No	No

UNIT I: INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT

Teaching Hours: 15

Introduction:Project – Software Projects vs other types of Project – Activities Covered by SPM – Some Ways of Categorizing Software Projects – Stakeholders, Setting Objectives – The Business Case - Project Success and Failure - Management and Management Control. Project Evaluation:A Business Case – Project Portfolio Management – Evaluation of Individual Projects – Cost Benefit Evaluation – Risk Evaluation.

UNIT II: PROJECT PLANNING AND SELECTION OF PROJECT APPROACH

Teaching Hours: 9

Project Planning - Introduction to Step Wise Project Planning – Step 0 to Step 10. Selection of an Appropriate Project Approach -Introduction – Build or Buy – Choosing Methodologies and Technologies – Software Processes and Process Models – Choice of Process Models – The Waterfall Model– Prototyping – other ways of categorizing prototype- Agile Methods – Extreme Programming - Selecting the Most Appropriate Process Model.

UNIT III: EFFORT ESTIMATION AND ACTIVITY PLANNING

Teaching Hours: 9

Effort Estimation – Introduction –Estimates – Problems with Over and Under-estimate – Basis for Software Estimating – Effort Estimation Techniques – Bottom-up Estimating – Top-down Approach and Parametric Models – Expert Judgment - Estimating by Analogy – Albrecht Function Point Analysis – Function Mark II – COCOMO&COCOMO II – Cost Estimation – Staffing Pattern. Activity Planning –Introduction – Objectives of Activity Planning – When to plan – Project Schedules – Project and Activities – Sequencing and Scheduling Activities – Networking Planning Models – Formulating a Network Model– Activity on Arrow Networks.

UNIT IV: RISK MANAGEMENT, RESOURCE ALLOCATION AND MONITORING

Teaching Hours: 9

Risk Management –Risk – Categories of Risk – A Framework for Dealing with Risk – Risk Identification – Risk Assessment – Risk Planning – Risk Management. Resource Allocation – Introduction – The Nature of Resources – Identifying Resource Requirements – Scheduling Resources. Monitoring –Creating the Framework – Collecting the Data – Review and Project Termination Review – Visualizing Progress – Cost Monitoring and Earned Value Analysis – Getting the Project Back to Target – Change Control – SCM.

UNIT V: MANAGING PEOPLE AND WORKING IN TEAMS

Teaching Hours: 9

Managing People –Understanding Behavior – Organizational Behavior – Selecting the Right Person for the Job – Instruction in the Best Methods – Motivation – The Oldham-Hackman Job Characteristics Model – Stress – Health and Safety. Working in Teams –Introduction – Becoming a Team – Decision Making – Organization and Team Structures – Coordination Dependencies – Dispersed and Virtual Teams – Communication Genres – Communication Plans – Leadership.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

    a. Book review and research paper review, syllabus and curriculum review.

    b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

    c. Workshops, preparing technical term dictionaries from text books and reference books.

    d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

    e. Forming digital library: collecting text and reference books, course material.

    f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

    g. Extracurricular and cultural activities may be framed through the syllabus content.

    h. Grouping students for self-discussion, self-learning process.

    i. Following institution and intellectual and writing reports in the course field.

Text

1. BOB Huges, Mike Cotterell, Rajib Mall "Software Project Management", McGraw Hill, Fifth Edition,2011.

References

    1. Futrell, "Quality software Project management", Pearson Education India.

    2. Royce, "Software Project Management", Pearson Education India.

Web References

    1. https://www.lynda.com/Project-Management-training-tutorials/39-0.html

    2. www.rspa.com/spi/project-mgmt.html

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	M	M	M	M	M	L	**S**	M	S	M	M	L	L
CO2	**S**	**S**	**S**	M	S	M	L	L	**S**	M	M	**S**	M	L	M
CO3	**S**	**S**	**S**	M	S	M	L	L	**S**	M	M	**S**	M	L	M
CO4	**S**	**S**	**S**	M	S	M	L	L	**S**	M	M	**S**	M	L	M
CO5	M	M	M	M	S	M	M	L	**S**	M	S	M	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **III**   Paper type:**Core Elective**   Paper code: **Paper -3**Name

of the Paper:**Core Elective C:Object Oriented Software**   Credit:**3**

Total Hours per Week:**3 Hours**Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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Course Objectives

1. To understand and demonstrate basic knowledge in object oriented software.
2. To identify requirements, analyze and prepare models.
3. To Plan, schedule and track the progress of the projects.
4. To Design & develop the software projects
5. To apply testing principles on software project and understand the maintenance concepts.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand and demonstrate basic knowledge in object oriented software
2. After studied unit-2, the student will be able toidentify requirements, analyze and prepare models.
3. After studied unit-3, the student will be able to plan, schedule and track the progress of the projects.
4. After studied unit-4, the student will be able to design & develop the software projects
5. After studied unit-5, the student will be able to apply testing principles on software project and understand the maintenance concepts.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	No	No	No	No
2	Yes	Yes	Yes	Yes	No	No
3	Yes	Yes	Yes	Yes	No	No
4	Yes	Yes	Yes	Yes	No	No

5	Yes	Yes	Yes	Yes	No	No

Unit – I: INTRODUCTION   Teaching Hours: 9

Introduction to objects - module - cohesion - coupling - data encapsulation - abstract data types - information hiding - objects, - inheritance - polymorphism & dynamic binding - cohesion & coupling of objects. Reusability, portability& interoperability - reuse concepts - impediments to reuse, reuse case studies - objects & productivity - reuse during design & implementation phases - reuse & maintenance, portability, why portability, techniques for achieving portability - interoperability - future trends in interoperability.

Unit – II: PLANNING AND ESTIMATION   Teaching Hours: 9

Planning and estimation - planning and the software process - estimating duration and cost - components of a software project management plan - software project management plan frame work - IEEE software project management plan - planning of testing - planning of object oriented projects - training requirements - documentation standards - CASE tools for planning and estimating - testing the software project management requirements phase - requirements analysis techniques - reusing the prototyping - human factors - rapid prototyping as a specification technique - reusing the rapid prototyping - other uses of rapid prototyping - management implication of the application design (JAD) - Comparison of requirement analysis techniques - testing during requirement phase - CASE tools for the requirement phase - metrics for the requirement phase –obsertoglesby case study: requirements phase obsertoglesby case study - rapid prototype - object oriented requirements.

Unit – III: SPECIFICATION PHASE   Teaching Hours: 9

Specification phase - specification document informal - specification - structured, systems analysis - other semi-formal techniques - entity relationship modeling - finite. state machines - Petrinets z357 - other formal techniques - comparison of specification techniques - testing during specification phase - CASE tools for the specification phase - metrics for the specification phase - obvert oglesy case study: Structured systems analysis - software project management. Object oriented analysis phase - object oriented versus structured paradigm - object oriented analysis -

elevator problem - use case modeling - dynamic modeling - testing during object oriented analysis phase - case tools - software project management.

Unit – IV: DESIGN PHASE   **Teaching Hours: 9**

Design phase - design and abstraction - action oriented design - data flow analysis - transaction analysis - data oriented design - object oriented design - elevator problem - formal techniques for detail designs - real time design techniques - testing - case tools - metrics - object oriented design- Implementation phase: choice or programming language - fourth generation language - good programming practice - coding standards - module reuse - module test case selection - black box - glass box module testing techniques - comparison clean room - potential problems when testing objects - management aspects of module testing- CASE tools for implementation phase.

Unit – V: IMPLEMENTATION and INTEGRATION PHASE   **Teaching Hours: 9**

Implementation and integration phase - testing - graphical user interfaces - product testing - acceptance testing - case tools for this phase - integration environments for business applications - public tools infrastructure - potential problems with environments. Maintenance phase - why maintenance is necessary - case study - management - maintenance of object oriented software - maintenance skill versus development skills - reverse engineering - testing - case tools.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.
b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise
c. Workshops, preparing technical term dictionaries from text books and reference books.
d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher
e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Stephen R. Schach - Classical and Object oriented Software Engineering 4th Edition - McGraw Hill
2. Ivar Jacobson - Object Oriented Software Engineering - Addison Wesley.

References

1. Grady Booch, Object Oriented Analysis and Design, Addison-Wesley. 5 ed 2009
2. Grady Booch, James Rumbaugh and Ivar Jacobson, Unified Modeling Language Guide, Addison-Wesley. 5ed 2009
3. Erich Gamma et al., Design Patterns: Elements of Reusable OO Software, Addison-Wesley.5 ed 2010
4. Michael L. Scott, Programming Language Pragmatics, Morgan-Kaufmann.5 ed 2006
5. Kim Bruce, Foundations of Object Oriented Languages, Prentice-Hall.6 2011

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2. http://www.indiabix.com/online-test/objectorientedsoftwareengineeringtest/

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	**S**	S	S	M	M	L	M	L	M	M	**S**	M	**S**	M
CO2	**S**	S	**S**	S	M	M	L	M	L	M	M	S	M	S	M
CO3	**S**	S	**S**	S	M	M	L	M	L	M	M	S	M	S	M
CO4	**S**	S	**S**	S	M	M	L	M	L	M	M	S	M	S	M
CO5	M	M	M	M	M	M	L	M	L	M	M	S	M	**S**	M

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **III**   Paper type:**Open Elective**   Paper code: **Paper -3**Name of the

Paper:**Open Elective A: Introduction to C**Credit:**3**

Total Hours per Week:**3 Hours**Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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Course Objectives

1. To enhance their analyzing and problem-solving skills and use the same for writing programs in C.
2. To develop logics and that will help them to create programs, applications in C.
3. To identify programming task involvedin a given computational problem.
4. To approachthe programming tasks using techniques learned and writepseudo-code.
5. To identify tasks in which the numerical techniques learned are applicable and apply them to write programs.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand the functional hierarchical code organization.

2. After studied unit-2, the student will be able tounderstand and create the programs on arrays and functions

3. After studied unit-3, the student will be able to work with pointers.

4. After studied unit-4, the student will be able to work with storage classes, structures and unions.

5. After studied unit-5, the student will be able work with the I/O operations.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating

1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT – I: DATA TYPES, OPERATORS AND STRUCTURES Teaching Hours: 9

Structure of a C program – Basic data types (int, float, char, double, void) – constants and variables (variable declaration, integer, real,float, character, variables) – operators and expressions (arithmetic operators, relational operators, logical operators, bitwise operators, type casting, type conversion, enumerated data type, typedef) – Control Constructs (if, switch, while, do…while, for, break and continue, exit() function, goto and label).

UNIT – II: ARRAYS AND FUNCTIONS   Teaching Hours: 9

Arrays (declaration, one and two dimensional arrays) - Character Arrays and Strings. Function Fundamentals (General form, Function Definition, Function arguments, return value) – Parameter passing: call-by-value and call-by-reference – Recursion – Passing Arrays to Function – Passing Strings to Function.

UNIT – III: POINTERS   Teaching Hours: 9

Understanding Pointers – Accessing the Address of a Variable – Declaring the Pointer Variables – Initialization of Pointer Variables – Accessing a Variable through its Pointer – Pointer Expressions – Pointers and Arrays – Pointers and Character Strings – Array of Pointers – Pointers as Function Arguments – Functions returning Pointers – Pointers to Functions.

UNIT – IV: STORAGE CLASSES, STRUCTURES AND UNIONSTeaching Hours: 9

Scope rules (Local variables and global variables, scope rules of functions) -Type modifiers and storage class specifier.

Structures – Basics of Structure – Declaring of Structure – Referencing Structure elements - Array of Structures – Nesting of Structures - Passing Structures to function – Pointers and Structures - Unions.

UNIT – V: FILE MANAGEMENT IN C   **Teaching Hours: 9**

Introduction – Defining and Opening a File – Closing a File – Input / Output Operations on Files – Command Line Arguments.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. E.Balagurusamy, "Programming in ANSI C", Seventh Edition, McGraw Hill Education Private Limited, NewDelhi: 2017.

References

1. YashavantKanetkar, "Let us C", BPB Publications, Tenth Edition - New Delhi: 2010
2. Ashok N.Kamthane, "Programming in C", Second Impression, Pearson: 2012.

Web References

1. http://www.c4learn.com/?gclid=COK1y6nHk7wCFcUA4godmlgAKA/

2. http://www.cprogramming.com/tutorial/c-tutorial.html/

3. http://www.tutorialspoint.com/cprogramming/

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	M	S	M	L	L	M	S	M	S	M	S	S
CO2	M	M	S	M	S	M	L	L	M	S	M	S	M	S	S
CO3	S	M	S	M	M	M	L	L	M	S	M	S	M	S	S
CO4	S	M	S	M	M	S	L	L	M	S	M	S	S	S	S
CO5	S	M	S	M	M	S	L	L	M	S	M	S	S	S	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **III**   Paper type:**Open Elective**   Paper code: **Paper -3**Name of the
Paper:**Open Elective A: Introduction to C#**Credit:**3**

Total Hours per Week:**3 Hours**Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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Course Objectives

1. To know the differences between desktop and web application.
2. To construct classes, methods, and accessor and instantiate objects.
3. To create and manipulate GUI components in C#.
4. To code solutions and compile C# projects within the .NET framework.
5. To build own desktop application with Database

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to the differences between desktop application and web application.
2. After studied unit-2, the student will be able toconstruct classes, methods, and access modifier and instantiate objects.
3. After studied unit-3, the student will be able to create and manipulate GUI components in C# for windows application.
4. After studied unit-4, the student will be able to code solutions and compile C# projects within the .NET framework using reflection and remoting.
5. After studied unit-5, the student will be able to build the desktop application with Database.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes

4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT - I: INTRODUCTION TO C#   Teaching Hours: 9

Introduction to .NET – Features of C# - Data Types – Value Types – Reference Types - Variables and Constants – Declaring – Assigning values – variables of nullable types – Operators – Type Conversions – Implicit and Explicit Type Conversions – Arrays – Single Dimensional and Multidimensional – Control Flow Statements – Selection – Iteration and Jump – Classes and Objects – Access Modifiers – Defining a Class – Variables – Properties and Methods – Creating Objects – Inheritance – Polymorphism- Constructor and Destructors.

UNIT - II: WINDOWS FORMS   Teaching Hours: 9

Windows Forms – Form Class – Common Operations on Forms – Creating a Message Box – Handling Events – Mouse Events – Keyboard Events – Common Controls in Windows Forms – Label – TextBox – Button – Combo Box – List Box – Check Box – Radio Button – Group Box – Picture Box – Timer – Open File Dialog – Save File Dialog – Font Dialog – Color Dialog – Print Dialog – Tree View – Menu.

UNIT - III: DELEGATES AND EVENTS   Teaching Hours: 9

Delegates – Declaring a Delegate – Defining Delegate Methods – Creating and Invoking Delegate Objects – Multicasting with Delegates – Events – Event Sources – Event Handlers – Events and Delegates.

UNIT - IV: REFLECTION AND REMOTING   Teaching Hours: 9

Life Cycle of threads-Using Reflection – Reflecting the Members of a Class - Dynamic Loading and Reflection - .NET Remoting – Architecture – Hosting of Objects – Single Ton and Single Call – Remoting Server – Remoting Client.

UNIT - V: DATABASE   Teaching Hours: 9

Creating Connection String – Creating a Connection to a Database – Creating a Command Object – Working with Data Adapters – Using Data Reader to work with Databases – Using Dataset.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text
1. Vikas Gupta , "Comdex .NET Programming " , Dream Tech Press, New Delhi, 2011
2. Kogent Solutions, " C# 2008 Programming Black Book", Dream Tech Press, New Delhi, Platinum Edition, 2009

References
1. Rebecca M.Riordon, "Microsoft ADO .Net 2.0 Step by Step", Prentice Hall of India Private Limited, New Delhi, 2007
2. David S.Platt , "Introducing Microsoft .Net", Prentice Hall of India(Private) Limited, Third Edition, New Delhi, 2006

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1. http://csharp.net-tutorials.com/index.php

2. http://csharp.net-tutorials.com/classes/introduction/

3. http://www.homeandlearn.co.uk/csharp/csharp.html

4. http://www.indiabix.com/c-sharp-programming/questions-and-answers/

5. https://www.wiziq.com/online-tests/43860-c-basic-quiz

6. http://www.withoutbook.com/OnlineTestStart.php?quizId=71

7. http://www.compileonline.com/compile_csharp_online.php

8. http://www.ideone.com

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **III**   Paper type:**Open Elective**   Paper code: **Paper -3**Name of the

Paper:**Open Elective C: Introduction to Python**Credit:**3**

Total Hours per Week:**3 Hours**Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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Course Objectives

1. To know the basics of algorithmic problem solving
2. To read and write simple Python programs.
3. To develop Python programs with conditionals and loops.
4. To define Python functions and call them.
5. To use Python data structures – lists, tuples, dictionaries.
6. To do input/output with files in Python.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able toexplore the fundamental concepts of Python and to understand the basics of Python programming language
2. After studied unit-2, the student will be able tosolve simple problems using Python using flow control and functions.
3. After studied unit-3, the student will be able to acquire fundamental knowledge and skills on Python Programming using file concepts.
4. After studied unit-4, the student will be able tounderstand OOPS concepts.
5. After studied unit-5, the student will be able to familiarize with web concepts using Python.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes

2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT - I: OVERVIEW   **Teaching Hours: 9**

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: FLOW CONTROL & FUNCTIONS   **Teaching Hours: 9**

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: MODULES, PACKAGES AND FILE HANDLING **Teaching Hours: 9**

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: Opening a File - Closing a File - Writing to a File – Reading from a File - File Methods - Renaming a File - Deleting a File - Directories in Python.

UNIT - IV: OBJECT ORIENTED PROGRAMMING   **Teaching Hours: 9**

Class Definition - Creating Objects - Built-in Attribute Methods - Built-in Class Attributes - Destructors in Python Encapsulation - Data Hiding- Inheritance - Method Overriding Polymorphism. Exception Handling: Built-in Exceptions - Handling Exceptions - Exception with Arguments- Raising Exception - User-defined Exception - Assertions in Python

UNIT - V: REGULAR EXPRESSIONS & WEB APPLICATIONS Teaching Hours: 9

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. Web Application Framework- Django Architecture- Starting development- Case Study: Blogging App.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Jeeva Jose and P. SojanLal, "Introduction to Computing and Problem Solving with Python", Khanna Book Publising Co. (P) Ltd., 2016.

2. ArshdeepBahga, Vijay Madisetti, "Cloud Computing: A Hands – On Approach" Universities press (India) Pvt. limited 2016.

References

1. Wesley J. Chun, "Core Python Programming", Second Edition, Prentice Hall Publication, 2006.

2. Timothy A Budd, "Exploring Python", Tata McGraw Hill, New Delhi, ISBN: 780071321228

Web References

1. www.learnpython.org/
2. https://www.codecademy.com/learn/python
3. https://www.Codementor.io
4. https://www.Python.org

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **IV** Paper type: **Core** Paper code: **Paper -10**Name of the

Paper:**Enterprise Java Programming** Credit:**3**

Total Hours per Week:**4 Hours**Lecture Hours: 3 Tutorial Hours: **1**Practical Hours: -

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Course Objectives

1. To expose the complete knowledge of MVC.
2. To learn about Java server faces.
3. To create applications using JSF.
4. To develop Enterprise web application using EJB.
5. To work with Java API's for cresting applications.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to develop JSP page using various techniques

2. After studied unit-2, the student will be able to develop JSF page using various techniques

3. After studied unit-3, the student will be able todevelop applications using Java Beans

4. After studied unit-4 the student will be able to develop the applicationsusing enterprise java beans.

5. After studied unit-5, the student will be able to working with Java API's for creating applications

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT – I:CONTROLLING WEB APPLICATION BEHAVIOUR WITH WEB.XML

Teaching Hours: 12

Understanding the purpose of web.xml - Customizing URLs - Turning off default URLs - Initializing servlets and JSP pages - Preloading servlets and JSP pages - Declaring filters - Designating welcome pages and error pages - Restricting access to Web resources.

UNIT – II: JAVA SERVER FACES *(JSF)*   **Teaching Hours: 12**

JSP Benefits, Framework roles, Simple JSF application, User Interface Component Model, Navigational Model, Life Cycle of JSF page, Using JSF in JSP Pages – Setting up a page, using core tags, using HTML tags, using localized messages, Using converters.

UNIT – III:DEVELOPING WITH JAVASERVER FACES TECHNOLOGY

Teaching Hours: 12

Registering listeners on components, validators, binding component values to external data sources, referencing a backing Bean method, using custom objects writing component properties, performing localization, creating custom converter, implementing event listener, creating custom validator, writing backing Bean methods.

UNIT – IV: ENTERPRISE JAVA BEANS (EJB)   **Teaching Hours: 12**

Introduction to Enterprise Beans, Session Bean, Entity Bean, Message driven Bean, defining clients access with interfaces, contents of an enterprise Bean, life cycle of enterprise Bean, creation of Enterprise Bean, application client, web client, other Enterprise Bean features, handling exceptions, mapping table relationships for Bean managed persistence, primary keys for bean managed persistence, container managed persistence – primary key for container managed persistence, Message driven Bean example – applicant client and message driven Bean class.

UNIT – V: JAVA MESSAGE SERVICE API   Teaching Hours: 12

Basic JMS API concepts – architecture, messaging domains – consumption- JMS API programming model – administered objects - connections - sessions - message producers-consumers – messages - exception handling - JMS client applications - creating robust JMS applications - Using JMS API in J2EE application.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

    a. Book review and research paper review, syllabus and curriculum review.

    b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

    c. Workshops, preparing technical term dictionaries from text books and reference books.

    d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

    e. Forming digital library: collecting text and reference books, course material.

    f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

    g. Extracurricular and cultural activities may be framed through the syllabus content.

    h. Grouping students for self-discussion, self-learning process.

    i. Following institution and intellectual and writing reports in the course field.

Text

Unit I

1. Marty Hall, Larry Brown, YaakovChaikin "Core Servlets and JavaServer Pages, Volume 2:advanced Technologies", 2nd Edition, Prentice Hall PTR.

Unit II, III, IV & V

2. Stephanie Bodoffetl., "The J2EE^{TM} Tutorial", Pearson Education, 2005.

References

1. David Geary, Cay Horstmann ,"Core JavaServer™ Faces",2nd Edition, Prentice Hall,2007.
2. Bill Dudney, Jonathan Lehr, Bill Willis, LeRoy Mattingly, "Mastering JavaServerFaces",Wiley publications.
3. Debu Panda, Reza Rahman, Derek Lane,"EJB 3 in Action", Manning publications.

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1. www.corejsf.com
2. www.roseindia.net
3. www.r4r.co.in
4. www.mkyong.com
5. www.java2s.com.

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **IV**   Paper type: **Core**   Paper code: **Paper -11**Name of the
Paper:**Python Programming**Credit:**3**

Total Hours per Week:**4 Hours**Lecture Hours: 3   Tutorial Hours:1Practical Hours: -

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Course Objectives

1. To know the basics of algorithmic problem solving and to read and write simple Python programs.
2. To develop Python programs with conditionals and loops.
3. To define Python functions and call them.
4. To use Python data structures – lists, tuples, dictionaries.
5. To do input/output with files in Python.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able toexplore the fundamental concepts of Python and to understand the basics of Python programming language
2. After studied unit-2, the student will be able to solve simple problems using Python using flow control and functions.
3. After studied unit-3, the student will be able to acquire fundamental knowledge and skills on Python Programming using file concepts.

4. After studied unit-4, the student will be able to understand OOPS concepts.

5. After studied unit-5, the student will be able to familiarize with web concepts using Python.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT - I: OVERVIEW   Teaching Hours: 12

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: FLOW CONTROL & FUNCTIONSTeaching Hours: 12

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: MODULES, PACKAGES AND FILE HANDLING Teaching Hours: 12

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: Opening a File - Closing a File - Writing to a

File – Reading from a File - File Methods - Renaming a File - Deleting a File - Directories in Python.

UNIT - IV: OBJECT ORIENTED PROGRAMMINGTeaching Hours: 12

Class Definition - Creating Objects - Built-in Attribute Methods - Built-in Class Attributes - Destructors in Python Encapsulation - Data Hiding- Inheritance - Method Overriding Polymorphism. Exception Handling: Built-in Exceptions - Handling Exceptions - Exception with Arguments- Raising Exception - User-defined Exception - Assertions in Python

UNIT - V: REGULAR EXPRESSIONS & WEB APPLICATIONS   Teaching Hours: 12

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. Web Application Framework- Django Architecture- Starting development- Case Study: Blogging App.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

   a. Book review and research paper review, syllabus and curriculum review.
   b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise
   c. Workshops, preparing technical term dictionaries from text books and reference books.
   d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher
   e. Forming digital library: collecting text and reference books, course material.
   f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.
   g. Extracurricular and cultural activities may be framed through the syllabus content.
   h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Jeeva Jose and P. SojanLal, "Introduction to Computing and Problem Solving with Python", Khanna Book Publising Co. (P) Ltd., 2016.
2. ArshdeepBahga, Vijay Madisetti, "Cloud Computing: A Hands – On Approach" Universities press (India) Pvt. limited 2016.

References

1. Wesley J. Chun, "Core Python Programming", Second Edition, Prentice Hall Publication, 2006.
2. Timothy A Budd, "Exploring Python", Tata McGraw Hill, New Delhi, ISBN: 780071321228

Web References

Online Tutorial

1. www.learnpython.org/
2. https://www.codecademy.com/learn/python
3. https://www.Codementor.io
4. https://www.Python.org

Mapping with Programmer Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **IV**   Paper type: **Core**   Paper code: **Paper -12**Name of the Paper:**Web Applications using C#**   Credit:**3**

Total Hours per Week:**4 Hours**Lecture Hours: 3   Tutorial Hours: **1**   Practical Hours: -

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Course Objectives

1. To understand the difference between desktop and dynamic web applications.
2. To understand the ASP.NET web application execution model.
3. To create and modify multi-page Web Form applications and Web Services
4. To demonstrate features like flow control,data access and data binding
5. To validate forms with in an application.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand the concept of web applications working process.
2. After studied unit-2, the student will be able to create and manipulate GUI components in C# for web application.
3. After studied unit-3, the student will be able to code solutions and compile component programming within the .NET framework.
4. After studied unit-4, the student will be able to create the user controls and custom controls within the .NET framework
5. After studied unit-5, the student will be able to build the web application with Database.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes

4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT- I: INTRODUCTION TO ASP.NET AND WEB FORMS   **Teaching Hours: 12**

Developing ASP.NET Applications - ASP.NET File Types - The bin Directory - Application Updates - A Simple Application from Start to Finish-web.config file Web Form Fundamentals - A Simple Page Applet - The Problem With Response.Write - Server Controls - HTML Server Controls - ViewState - The HTML Control Classes - Events - Event Handling Changes - The Currency Converter application-Adding Support for Multiple Currencies - Adding Linked Images - Setting Styles – A Deeper Look at HTML control classes-HTML control events-The HTML control Base class-The HtmContainerControl Class-The HtmlInputControl Class-The Page class-The Controls collection-The HttpRequest Class-The HttpResponse Class-The ServerUtility Class-Assessing HTML Server controls

UNIT - II: WEB CONTROLS   **Teaching Hours: 12**

Web Controls - Stepping Up to web Controls - Basic Web Control Classes - The web Control Tags - The WebControl Base Class - Units Enumerated Values - Colors - Fonts - List Controls - Table Controls - AutoPostBack and Web Control Events - How Postback Events Work - The Page Lifecycle - The Greeting Card Applet - Validation and rich Controls- The Calendar Control-Formatting the Calendar-restricting Dates- The AdRotator control-The Wizard control-Validation-The Validation Controls -The Validation Process-The Validator Class-A Simple Validation Example –Sever side example-Manual Validation-Understanding Regular Expressions-Literals and MetaCharacters-Finding a Regular expression- A Validated Customer Form

UNIT - III: COMPONENT BASED PROGRAMMING   **Teaching Hours: 12**

Introduction – Creating a Simple Component   – Properties and State – Database Components – Consuming the Database Component – Enhancing the Component with Error Handling – Aggregate Information – Data Objects.

UNIT - IV: CUSTOM CONTROLS   Teaching Hours: 11

User Controls – Creating a Simple User Control – Visual Studio.NET Custom Control Support – Independent User Controls – Integrated User Controls – User Control Events – Limitations – Deriving Custom Controls.

UNIT - V: DATABASE ACCESS WITH COMMAND, ADAPTER AND XML
        Teaching Hours: 13

ADO.NET Data Access - About the ADO.NET Example - Obtaining the Sample Database - Simple Data Access - Simple Data Update - Importing the Namespaces - Creating a Connection - The Connection String SQL - Making the Connection - Defining the Select Command - Using a Command with a DataReader - Updating Data - Using Update - Insert - and Delete Commands - Accessing Disconnected Data - Selecting Disconnected Data - Selecting Multiple Tables - Modifying Disconnected Data - Modifying and Deleting Rows - Adding Information - to a DataSet - Updating Disconnected Data - The Command Builder - Updating a DataTable - Controlling Updates - An Update Example – Using XML - XML's Hidden Role in .NET - XML Basics - Attributes - Comments - The XML Classes - the XML TextWriter - The XML Text Reader - Working with XML Documents - Reading an XML Document - Searching an XML Document - XML Validation – CreatingXML Schema -XSD Documents - Validating an XML File.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.
b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise
c. Workshops, preparing technical term dictionaries from text books and reference books.
d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher
e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Mathew MacDonald, "ASP.NET: The Complete Reference", Tata McGraw Hill Publishing Company Ltd., New Delhi, 2006

2. Dino Eesposito, "Introducing Microsoft ASP.NET 2.0", AsokeK.Ghosh, Prentice Hall of India, Eastern Economy Edition, New Delhi, 2006

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1. Stephen Walther,"ASP.NET 3.5 Unleashed", Pearson Education, Dorling Kindersley Pvt. Ltd, Second Edition, 2008

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2. http://csharp.net-tutorials.com/classes/introduction/
3. http://www.homeandlearn.co.uk/csharp/csharp.html
4. http://www.indiabix.com/c-sharp-programming/questions-and-answers/
5. https://www.wiziq.com/online-tests/43860-c-basic-quiz
6. http://www.withoutbook.com/OnlineTestStart.php?quizId=71
7. http://www.compileonline.com/compile_csharp_online.php
8. http://www.ideone.com

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **IV**   Paper type:**Practical**   Paper code: **Paper -10**Name of the

Paper:**Practical 10: Enterprise Java Programming**Credit:**2**

Total Hours per Week:**3 Hours**   Lecture Hours:-Tutorial Hours:**-**Practical Hours: **3**

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Course Objectives

1.   To expose the complete knowledge of MVC.
2.   To learn about Java server faces.
3.   To create applications using JSF.
4.   To develop Enterprise web application using EJB.
5.   To work with Java API's for cresting applications.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to develop JSP page using various techniques

2. After studied unit-2, the student will be able to develop JSF page using various techniques

3. After studied unit-3, the student will be able todevelop applications using Java Beans

4. After studied unit-4 the student will be able to develop the applicationsusing enterprise java beans.

5. After studied unit-5, the student will be able to working with Java API's for creating applications.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes

5	Yes	Yes	Yes	Yes	Yes	Yes

1. Simple JSP Application
2. JSF in JSP Pages
3. Using all HTML render kit
4. Using all Core render kit
5. Creating Enterprise Bean
6. Creating Web Client
7. Using Session Bean
8. Bean Managed Persistence and Container Managed Persistence
9. Creating Simple JMS Client Applications
10. Creating Robust JMS Applications

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **IV**   Paper type:**Practical**   Paper code: **Paper -11**Name of the Paper:**Practical 11: Python programming** Credit:**2**

Total Hours per Week:**3 Hours**   Lecture Hours:-Tutorial Hours:**-**Practical Hours: **3**

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Course Objectives

1. To know the basics of algorithmic problem solving and to read and write simple Python programs.
2. To develop Python programs with conditionals and loops.
3. To define Python functions and call them.
4. To use Python data structures – lists, tuples, dictionaries.
5. To do input/output with files in Python.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able toexplore the fundamental concepts of Python and to understand the basics of Python programming language
2. After studied unit-2, the student will be able to solve simple problems using Python using flow control and functions.
3. After studied unit-3, the student will be able to acquire fundamental knowledge and skills on Python Programming using file concepts.
4. After studied unit-4, the student will be able to understand OOPS concepts.
5. After studied unit-5, the student will be able to familiarize with web concepts using Python.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes

4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

1. Working with numbers
2. Implementing String operations
3. Working with Tuples and Set
4. Implementation of Dictionaries
5. Demonstrating List Operations.
6. Flow Control and Functions
7. Modules and Packages
8. File handling
9. Object Oriented Programming
10. Exception Handling and Regular Expressions

Mapping with Programmer Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **IV**   Paper type:**Practical** Paper code: **Paper -12**Name of the Paper:**Practical**

12: Web Applications using C#   Credit:**2**

Total Hours per Week:**3 Hours** Lecture Hours:-Tutorial Hours:**-**Practical Hours: **3**

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Course Objectives

1. To understand the difference between desktop and dynamic web applications.
2. To understand the ASP.NET web application execution model.
3. To create and modify multi-page Web Form applications and Web Services
4. To demonstrate features like flow control,data access and data binding
5. To validate forms with in an application.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to understand the concept of web applications working process.
2. After studied unit-2, the student will be able to create and manipulate GUI components in C# for web application.
3. After studied unit-3, the student will be able to code solutions and compile component programming within the .NET framework.
4. After studied unit-4, the student will be able to create the user controls and custom controls within the .NET framework
5. After studied unit-5, the student will be able to build the web application with Database.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes

4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

1. Web Configuration File

2. Viewstate

3. HTML Control Classes, Control Events, Container and Input Control Classes,

4. Web Control Classes & Control Tags

5. Validation Controls

6. Rich Controls

7. Data Access

8. Components

9. Custom Controls

10. User Controls

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **IV**   Paper type:**Core Elective**   Paper code: **Paper -4**Name of the Paper:**Core Elective A:Internet of Things** Credit:**3**

Total Hours per Week:**3 Hours**   Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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Course Objectives

1. To design and Develop IOT based solution for real world applications
2. To realize the evolution of Internet in Mobile Devices, Cloud & Sensor Networks
3. To learn about the different protocols of IOT.
4. To understand the development of Internet of Things applications and its characteristics.
5. To understand the concepts of IOT and its application using Arduino IDE.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to design and Develop IOT based solution for real world applications.
2. After studied unit-2, the student will be able to realize the evolution of Internet in Mobile Devices, Cloud & Sensor Networks.
3. After studied unit-3, the student will be able to understand the different protocols for IOT.
4. After studied unit-4, the student will be able to build applications using IOT.
5. After studied unit-5, the student will be able to learn to design IOT applications using Arduino IDE.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	No	No
2	Yes	Yes	Yes	Yes	No	No
3	Yes	Yes	Yes	Yes	No	No

| 4 | Yes | Yes | Yes | Yes | No | No |
| 5 | Yes | Yes | Yes | Yes | No | No |

UNIT - I: INTRODUCTION   Teaching Hours: 9

Introduction and Definition of Internet of Things, IoT Growth – A Statistical View, Application Areas of IoT, Characteristics of IoT, Things in IoT, IoT Stack, Enabling Technologies, IoT Challenges, IoT Levels, Is Cyber Physical System the same as IoT? Is WSN the same as IoT?

UNIT - II: INTRODUCTION TO SENSORS, MICROCONTROLLERS, AND THEIR INTERFACING

Teaching Hours: 9

Introduction to Sensor Interfacing, Types of Sensors, Controlling Sensors through Webpages, Microcontrollers: A Quick Walkthrough, ARM. Protocols for IoT – Messaging and Transport Protocols, Messaging Protocols (MQTT, CoAP, AMQP), Transport Protocols (Li-Fi, BLE).

UNIT - III: PROTOCOLS FOR IOT   Teaching Hours: 9

Addressing and Identification, Internet Protocol Version 4 (IPv4), Internet Protocol Version 6 (IPv6), Uniform Resource Identifier (URI). Cloud for IoT - Introduction, IoT with Cloud – Challenges, Selection of Cloud Service Provider for IoT Applications: An Overview, Introduction to Fog Computing, Cloud Computing: Security Aspects, Case Study: How to use Adafruit Cloud? Application of Data Analytics in IOT.

UNIT - IV: APPLICATION BUILDING WITH IOT   Teaching Hours: 9

Introduction, Smart Perishable Tracking with IoT and Sensors, Smart Healthcare – Elderly Fall Detection with IoT and Sensors, Smart Inflight Lavatory Maintenance with IoT, IoT–Based Application to Monitor Water Quality, Smart Warehouse Monitoring – Let the Drone Fly for You, Smart Retail – IoT Possibilities in the Retail Sector, Prevention of Drowsiness of Drivers by IoT-Based Smart Driver Assistance Systems, System to Measure Collision Impact in an

Accident with IoT.

UNIT - V: GETTING FAMILIARIZED WITH ARDUINO IDE   Teaching Hours: 9

Architecture, Arduino Programming, A Simple Application, Arduino Playground. Getting Familiarized with Raspberry Pi - Story behind Raspberry Pi, Architecture, Compatible Peripherals, Add-Ons, and Accessories, Operating System for Raspberry Pi, Setting up Raspberry Pi, Initial Configuration for Raspberry Pi, Linux Based Softwares in Raspberry Pi, Application Development with Raspberry-Pi – A Quick Walk Through.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Shriram K Vasudevan, Abhishek S Nagarajan, RMDSundaram, Internet of Things, Wiley, India, 2019.

References

1. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-on Approach)", 1st Edition, VPT, 2014.

2. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013.

Web References

1. https://www.coursera.org/courses?query=iot
2. https://online.stanford.edu/courses/xee100-introduction-internet-things
3. https://www.tutorialspoint.com/internet_of_things/index.htm

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **IV**   Paper type:**Core Elective**   Paper code: **Paper -4**Name

of the Paper:**B: Cloud Computing**   Credit:**3**

Total Hours per Week:**3 Hours**   Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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COURSE OBJECTIVES

1. To introduce the broad perceptive of cloud architecture and model.
2. To understand the concept of parallel and distributed computing
3. To be familiar with the different technologies.
4. To understand the features of virtualization.
5. To learn to design the trusted cloud Computing system with different cloud platforms

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to know the broad perceptive of cloud architecture and model.

2. After studied unit-2, the student will be abletofamiliar with virtualization and design of Cloud services

3. After studied unit-3, the student will be able to know the broad perceptive of cloud architecture and model.

4. After studied unit-4, the student will be able to understand ANEKA and create cloud applications.

5. After studied unit-5, the student will be able to understand the industry familiar cloud platforms

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	No	No
2	Yes	Yes	Yes	Yes	No	No
3	Yes	Yes	Yes	Yes	No	No

4	Yes	Yes	Yes	Yes	No	No
5	Yes	Yes	Yes	Yes	No	No

UNIT - I: INTRODUCTION   Teaching Hours: 9

Cloud Computing at a Glance, The Vision of Cloud Computing, Defining a Cloud, Cloud Computing Reference Model, Characteristics and Benefits, Challenges Ahead, Historical Developments - Distributed Systems, Virtualization, Web 2.0, Service-Oriented Computing, Utility-Oriented Computing, Building Cloud Computing Environments - Application Development, Infrastructure and System Development, Computing Platforms and Technologies - Amazon Web Services (AWS), Google AppEngine, Microsoft Azure, Hadoop, Force.com and Salesforce.com

UNIT – II: PRINCIPLES OF PARALLEL AND DISTRIBUTED COMPUTING

Teaching Hours: 10

Parallel vs. Distributed Computing ,   Elements of Parallel Computing - Hardware Architectures for Parallel Processing,   Approaches to Parallel Programming, Levels of Parallelism, Laws of Caution, Elements of Distributed Computing - General Concepts and Definitions, Components of a Distributed System, Architectural Styles for Distributed Computing, Models for Inter-Process Communication, Technologies for Distributed Computing - Remote Procedure Call, Distributed Object Frameworks, Service Oriented Computing.

Virtualization - Introduction, Characteristics of Virtualized Environments, Taxonomy of Virtualization Techniques, Execution Virtualization, and Other Types of Virtualization, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Examples - Xen: Paravirtualization, VMware: Full Virtualization, Microsoft Hyper-V.

UNIT - III: CLOUD COMPUTING ARCHITECTURE   Teaching Hours: 8

Introduction, Cloud Reference Model - Architecture, Infrastructure / Hardware as a Service, Platform as a Service, Software as a Service, Types of Clouds - Public Clouds, Private Clouds,

Hybrid Clouds, Community Clouds, Economics of the Cloud, Open Challenges - Cloud Definition, Cloud Interoperability and Standards, Scalability and Fault Tolerance, Security, Trust, and Privacy, Organizational Aspects. High-Throughput Computing: Task Programming - Task Computing, Characterizing a Task, Computing Categories, Frameworks for Task Computing, Task-based Application Models, Aneka Task-Based Programming.

UNIT - IV: ANEKA   Teaching Hours: 9

Cloud Application Platform - Framework Overview, Anatomy of the Aneka Container - From the Ground Up: Platform Abstraction Layer, Fabric Services, Foundation Services, Application Services, Building Aneka Clouds - Infrastructure Organization Logical Organization, Private Cloud Deployment Mode, Public Cloud Deployment Mode, Hybrid Cloud Deployment Mode, Cloud Programming and Management - Aneka SDK   , Management Tools. Concurrent Computing: Thread Programming- Introducing Parallelism for Single Machine Computation, Programming Applications with Threads - Techniques for Parallel Computation with Threads, Multithreading with Aneka - Introducing the Thread Programming Model, Aneka Thread vs. Common Threads, Programming Applications with Aneka Threads - Aneka Threads Application Model, Domain Decomposition: Matrix MultiplicationFunctional Decomposition: Sine, Cosine, and Tangent.

UNIT - V: CLOUD PLATFORMS IN INDUSTRY   Teaching Hours: 9

Amazon Web Services   - Compute Services, Storage Services, Communication Services, Google AppEngine - Architecture and Core Concepts, Application Life-Cycle, Cost Model, Observations, Microsoft Azure - Azure Core Concepts - SQL Azure - Windows Azure Platform Appliance. Cloud Applications - Scientific Applications - Healthcare: ECG Analysis in the Cloud - Biology: Protein Structure Prediction - Biology: Gene Expression Data Analysis for Cancer Diagnosis - Geoscience: Satellite Image Processing, Business and Consumer Applications - CRM and ERP - Productivity - Social Networking - Media Applications - Multiplayer Online Gaming. Advanced Topics in Cloud Computing - Energy Efficiency in Clouds, Market Based Management of Clouds, Federated Clouds / InterCloud, Third Party Cloud Services

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.
b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise
c. Workshops, preparing technical term dictionaries from text books and reference books.
d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher
e. Forming digital library: collecting text and reference books, course material.
f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.
g. Extracurricular and cultural activities may be framed through the syllabus content.
h. Grouping students for self-discussion, self-learning process.
i. Following institution and intellectual and writing reports in the course field.

Text

1. RajkumarBuyya, Christian Vecchiola, and S. ThamaraiSelvi. Mastering cloud computing: foundations and applications programming. Tata McGraw Hill Education Private Limited, New Delhi , 2013

References

1. Rittinghouse and Ransome, Cloud Computing: Implementation, Management, and Security, CRC Press, 2016.
2. Michael Miller "Cloud Computing Web based application that change the way you work and collaborate online". Pearson edition, 2008.
3. Kris Jamsa, Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More, Jones & Bartlett Learning, 2012.

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1. https://www.ibm.com/cloud
2. https://www.javatpoint.com/cloud-computing-tutorial

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **IV**   Paper type:**Core Elective**   Paper code: **Paper -4**Name of the
Paper:**C: Big Data Analytics** Credit:**3**

Total Hours per Week:**3 Hours**   Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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COURSE OBJECTIVES

1. To understand the needs for Big Data and its environments.
2. To learn the basic requirements of Big Data Technologies.
3. To expose the knowledge of MapReduce programming framework(Hadoop).
4. To be familiar with withNoSQL DB's Cassandra and MongoDB
5. To understand Hive and Pig technologies for analyzing the Big Data.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to learn about types of digital data and   big data
2. After studied unit-2, the student will be able to gain knowledge of various Big data analytics and its Technologies
3. After studied unit-3, the student will be able to study about various NoSQL databases and management techniquesMongoDB and Cassendra
4. After studied unit-4, the student will be able to work with Hadoop
5. After studied unit-5, the student will be able to analyse big data with Hadoop using MapReduce.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	No	No
2	Yes	Yes	Yes	Yes	No	No
3	Yes	Yes	Yes	Yes	Yes	Yes

4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	No	No

UNIT – I: INTRODUCTION TO BIG DATA   Teaching Hours: 9

Data, Characteristics of data and Types of digital data: Unstructured, Semi-structured and Structured, Sources of data, Working with unstructured data, Evolution and Definition of big data, Characteristics and Need of big data, Challenges of big data, Data environment versus big data environment

UNIT – II: BIG DATA ANALYTICS   Teaching Hours: 9

Overview of business intelligence, Data science and Analytics, Meaning and Characteristics of big data analytics, Need of big data analytics, Classification of analytics, Challenges to big data analytics, Importance of big data analytics, Basic terminologies in big data environment

UNIT – III: BIG DATA TECHNOLOGIES AND DATABASES   Teaching Hours: 9

Introduction to NoSQL, Uses, Features and Types, Need, Advantages, Disadvantages and Application of NoSQL, Overview of NewSQL, Comparing SQL, NoSQL and NewSQL, Introduction to MongoDB and its needs, Characteristics of MongoDB, Introduction of apache cassandra and its needs, Characteristics of Cassandra

UNIT – IV: HADOOP FOUNDATION FOR ANALYTICS   Teaching Hours: 9

History, Needs, Features, Key advantage and Versions of Hadoop, Essential of Hadoop ecosystems, RDBMS versus Hadoop, Key aspects and Components of Hadoop, Hadoop architectures

UNIT – V: HADOOPMAPREDUCE AND YARN FRAMEWORK: Teaching Hours: 9

Introduction to MapReduce, Processing data with Hadoop using MapReduce, Introduction to YARN, Components, Need and Challenges of YARN, Dissecting YARN, MapReduce application, Data serialization and Working with common serialization formats, Big data serialization formats

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

    a. Book review and research paper review, syllabus and curriculum review.

    b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

    c. Workshops, preparing technical term dictionaries from text books and reference books.

    d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

    e. Forming digital library: collecting text and reference books, course material.

    f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

    g. Extracurricular and cultural activities may be framed through the syllabus content.

    h. Grouping students for self-discussion, self-learning process.

    i. Following institution and intellectual and writing reports in the course field.

Text

1. Seema Acharya and SubhashiniChellappan, "Big Data and Analytics", Wiley India Pvt. Ltd., 2016

Reference

1. "Big Data" by Judith Hurwitz, Alan Nugent, Dr. Fern Halper and Marcia Kaufman, Wiley Publications, 2014.

2. "Big Data Imperatives : Enterprise Big Data Warehouse, BI Implementations and Analytics" by SoumendraMohanty, MadhuJagadeesh and HarshaSrivatsa, Apress Media, Springer Science + Business Media New York, 2013

3. "Mining of Massive Datasets", AnandRajaraman, Jure Leskovec, Jeffery D. Ullman, Springer, July 2013.

4. "Hadoop: The definitive Guide", Tom White, O'Reilly Media, 2010.

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2. http://blogs.computerworld.com/18840/big_data_smaq_down_storage_mapreduce_and_q uery

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **IV**   Paper type:**Open Elective**   Paper code: **Paper -4**Name of the

Paper:**A: Introduction to Database System**Credit:**3**

Total Hours per Week:**3 Hours** Lecture Hours: 3   Tutorial Hours:-Practical Hours:**-**

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Course Objectives

1. To have a broad understanding of database concepts and database management system software
2. To have a high-level understanding of major DBMS components and their function
3. To be able to model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model.
4. To be able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
5. To be able to program a data-intensive application using DBMS APIs.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to have a broad understanding of database concepts and database management system software
2. After studied unit-2, the student will be able to model an application's data requirements using conceptual modelling tools like ER diagrams and design database schemas based on the conceptual model
3. After studied unit-3, the student will be able tohave a high-level understanding of major DBMS components and their function
4. After studied unit-4, the student will be able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS
5. After studied unit-5, the student will be able to program a data-intensive application using DBMS APIs

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	No	No
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT-I: INTRODUCTION   Teaching Hours: 9

File System Vs. DBMS - Database System Applications - View of Data-Database language - Database design - ER Model _ Relational Model - Network Data Model - Hierarchical Data Model - Data Storage & Querying - Data Architecture.

UNIT-II: RELATIONAL MODEL   Teaching Hours: 9

Relational Model - Structure of Relational Databases - Relational Algebra and Calculus - SQL - Basic Structure - Set Operations - Aggregate Functions - Null Values - Nested Queries - Complex Queries - Views - Modification of the Database - Advanced SQL - Triggers.

UNIT-III: FUNCTIONAL DEPENDENCIES   Teaching Hours: 9

Functional Dependencies - Features of Relational designs - Decomposition and Normalization using Functional Dependencies and Multivalued Dependencies - Join dependencies- Domain key Normal form.

UNIT- IV: PHYSICAL STORAGE MEDIA   Teaching Hours: 9

Overview of Physical Storage Media - Magnetic disks - RAID - tertiary Storage - File Organization - Organization of records in Files - Indexing and Hashing - Ordered Indices - B+ - Tree Index Files - B-Tree Index Files - multiple Key Access - Static and Dynamic Hashing - Query Processing - Transaction Management - Transactions - Concurrency.

UNIT-V: DISTRIBUTED DATABASES   **Teaching Hours: 9**

Distributed Databases - Homogeneous and Heterogeneous Databases - Distributed Data Storage - Distributed Transactions - Commit Protocols - Concurrency Control - Object Based Databases - Complex Data types - Structured Types and Inheritance in SQL – Object identity and Reference - Types in SQL - XML - structure of XML data - XML Document - Schema - Querying and Transformation - Data Mining and Data Warehousing.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

   a. Book review and research paper review, syllabus and curriculum review.

   b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

   c. Workshops, preparing technical term dictionaries from text books and reference books.

   d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

   e. Forming digital library: collecting text and reference books, course material.

   f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

   g. Extracurricular and cultural activities may be framed through the syllabus content.

   h. Grouping students for self-discussion, self-learning process.

   i. Following institution and intellectual and writing reports in the course field.

Text

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- "Database System Concepts", FifthEdition,McGraw-Hill,2006.

References

1. Raghu Ramakrishnan and Johannes Gehrke, "Database Management Systems", Tata McGraw-Hill Publishing Company, 2003.

2. RamezElmasri and Shamkant B. Navathe, "Fundamental Database Systems", Third Edition, Pearson Education, 2003.

3. Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom- "Database System Implementation"- Pearson Education- 2000.

4. Narang,"Database Management Systems", 2nd ed., PHI.

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2. http://www.rjspm.com/PDF/BCA-428%20Oracle.pdf
3. http://kadakiaeducation.edu.in/Course/BCA/Course%20Material/RDBMS.pdf

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **IV**   Paper type:**Open Elective**   Paper code: **Paper -4**Name of the

Paper:**B: Introduction to IOT**   Credit:**3**

Total Hours per Week:**3 Hours**   Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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Course Objectives

1. To design and Develop IOT based solution for real world applications
2. To realize the evolution of Internet in Mobile Devices, Cloud & Sensor Networks
3. To learn about the different protocols of IOT.
4. To understand the development of Internet of Things applications and its characteristics.
5. To understand the concepts of IOT and its application using Arduino IDE.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to design and Develop IOT based solution for real world applications.
2. After studied unit-2, the student will be able to realize the evolution of Internet in Mobile Devices, Cloud & Sensor Networks.
3. After studied unit-3, the student will be able to understand the different protocols for IOT.
4. After studied unit-4, the student will be able to build applications using IOT.
5. After studied unit-5, the student will be able to learn to design IOT applications using Arduino IDE.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating
1	Yes	Yes	Yes	Yes	No	No

2	Yes	Yes	Yes	Yes	No	No
3	Yes	Yes	Yes	Yes	No	No
4	Yes	Yes	Yes	Yes	No	No
5	Yes	Yes	Yes	Yes	No	No

UNIT - I: INTRODUCTION   **Teaching Hours: 9**

Introduction and Definition of Internet of Things, IoT Growth – A Statistical View, Application Areas of IoT, Characteristics of IoT, Things in IoT, IoT Stack, Enabling Technologies, IoT Challenges, IoT Levels, Is Cyber Physical System the same as IoT? Is WSN the same as IoT?

UNIT - II: INTRODUCTION TO SENSORS, MICROCONTROLLERS, AND THEIR INTERFACING

Teaching Hours: 9

Introduction to Sensor Interfacing, Types of Sensors, Controlling Sensors through Webpages, Microcontrollers: A Quick Walkthrough, ARM. Protocols for IoT – Messaging and Transport Protocols, Messaging Protocols (MQTT, CoAP, AMQP), Transport Protocols (Li-Fi, BLE).

UNIT - III: PROTOCOLS FOR IOT   **Teaching Hours: 9**

Addressing and Identification, Internet Protocol Version 4 (IPv4), Internet Protocol Version 6 (IPv6), Uniform Resource Identifier (URI). Cloud for IoT - Introduction, IoT with Cloud – Challenges, Selection of Cloud Service Provider for IoT Applications: An Overview, Introduction to Fog Computing, Cloud Computing: Security Aspects, Case Study: How to use Adafruit Cloud? Application of Data Analytics in IOT.

UNIT - IV: APPLICATION BUILDING WITH IOT   **Teaching Hours: 9**

Introduction, Smart Perishable Tracking with IoT and Sensors, Smart Healthcare – Elderly Fall Detection with IoT and Sensors, Smart Inflight Lavatory Maintenance with IoT, IoT–Based Application to Monitor Water Quality, Smart Warehouse Monitoring – Let the Drone Fly for

You, Smart Retail – IoT Possibilities in the Retail Sector, Prevention of Drowsiness of Drivers by IoT-Based Smart Driver Assistance Systems, System to Measure Collision Impact in an Accident with IoT.

UNIT - V: GETTING FAMILIARIZED WITH ARDUINO IDE   **Teaching Hours: 9**

Architecture, Arduino Programming, A Simple Application, Arduino Playground. Getting Familiarized with Raspberry Pi - Story behind Raspberry Pi, Architecture, Compatible Peripherals, Add-Ons, and Accessories, Operating System for Raspberry Pi, Setting up Raspberry Pi, Initial Configuration for Raspberry Pi, Linux Based Softwares in Raspberry Pi, Application Development with Raspberry-Pi – A Quick Walk Through.

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

a. Book review and research paper review, syllabus and curriculum review.

b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise

c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Shriram K Vasudevan, Abhishek S Nagarajan, RMDSundaram, Internet of Things, Wiley, India, 2019.

References

1. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-on Approach)", 1stEdition, VPT, 2014.

2. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013.

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1. https://www.coursera.org/courses?query=iot
2. https://online.stanford.edu/courses/xee100-introduction-internet-things
3. https://www.tutorialspoint.com/internet_of_things/index.htm

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	M	L	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)

Semester: **IV**   Paper type:**Open Elective**   Paper code: **Paper -4**Name of the

Paper:**C: Introduction to Mobile Application**   Credit:**3**

Total Hours per Week:**3 Hours** Lecture Hours: 3   Tutorial Hours:**-**Practical Hours:**-**

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Course Objectives

1. To know the basis of Android application and development environment
2. To able to develop simple and professional application
3. To get ready for the job opportunity in mobile application development
4. To develop mobile applications using Pictures, Menus and SQLite
5. To develop mobile applications using Emailing and Telephony concepts.

Course Outcomes (five outcomes for each units should be mentioned)

1. After studied unit-1, the student will be able to Know about the mobile application development environment

2. After studied unit-2, the student will be able todevelop interface and design using Activities, Intents and Fragments

3. After studied unit-3, the student will be able to develop mobile applications using different Views

4. After studied unit-4, the student will be able to develop mobile applications using Pictures, Menus and SQLite

5. After studied unit-5, the student will be able to develop mobile applications using Emailing and Telephony concepts.

Matching Table (Mark tick symbol in the appropriate box)

Unit	i. Remembering	ii. Understanding	iii. Applying	iv. Analyzing	v. Evaluating	vi. Creating

1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes

UNIT - I: INTRODUCTION TO ANDROID   **Teaching Hours: 9**

History of Android Platform- Android APIs- Android Architecture Application Framework- Features of Android- Android Applications- Application Components - Manifest File- Downloading and Installing Android and Android SDK - Setting up Android Virtual and physical Device - Exploring the Development Environment - The Java Perspective Using Eclipse - DDMS Perspective - Command-Line Tools- Developing and Executing the First Android Application - Using Eclipse IDE to Create an Application - Running Your Application - Exploring the Application - Using Command - Line Tools.

UNIT – II: ACTIVITIES, INTENTS AND FRAGMENTS   **Teaching Hours: 9**

Working with Activities- Creating an Activity- Starting an Activity – Managing the Life cycle of an Activity - Applying Themes and Styles to an Activity- Displaying a Dialog in the Activity - Hiding the title of the activity- Using Intents-Exploring Intent Objects- Exploring Intent Resolution- Exploring Intent Filters - Resolving Intent Filter Collision - Linking the Activities Using Intent - Obtaining Results from Intent – Passing Data Using an Intent Object- Fragments - Hiding Title Bar and Screen Orientation - Fragment Implementation - Finding Fragments - Adding, Removing and Replacing Fragments - Finding Activity Using Fragment - Using the Intent Object to Invoke Built-in Application..

UNIT - III: UI USING VIEWS AND VIEW - GROUPS   **Teaching Hours: 9**

Working with View Groups – Linear Layout – Relative Layout – Scroll Layout – Table Layout – Frame Layout – Tab Layout using the Action Bar – Working with Views – Text – Edit Text –

Button – Radio Button – Check Box – Image Button – Toggle Button – Rating Bar – Binding Data with Adapter View Class – List View – Spinner – Gallery – Designing the Auto Text Complete View – Screen Orientation – Anchoring the Views of Current Activity – Handling UI Events – Handling User Interaction with Activities and Views – Specialized Fragments – List Fragment – Dialog Fragment – Preference Fragment – Creating Menus, Option Menus, Context Menu and Sub Menu.

UNIT - IV: HANDLING PICTURES AND MENUS WITH VIEWS AND STROING THE DATA

Teaching Hours: 9

Working with Image Views – Displaying Images in the Gallery View – Displaying Images in the Grid View – Using the Image Switcher View- Designing Context Menu for Image View- Using the Analog-Clock and Digital Clock Views – Embedding Web Browser in an Activity - Notifying the User Creating the Toast Notification - Creating the Status Bar Notification- Creating the Dialog Notification - Introducing the Data Storage Options - Using Preferences - Using the SQLite Database Creating the Database - Executing the Database Operations.

UNIT - V: EMAILING, TELEPHONY AND SMS IN ANDROID   Teaching Hours: 9

Building an Application to Send Email - Handling Telephony - Displaying Phone InformationApplication Receiving Phone Calls – Making Outgoing Phone Calls Application - Handling SMS Sending SMS Using SMS Manager - Sending SMS Using Intent - Receiving SMS Using the Broadcast Receiver Object- Role of Default SMS Providers - . Publishing Android Application: Export android application – Google play store registration.
Supplementary Learming: Building Mobile Applications using Xamarin

Internal Assessment Methods: (The following items may be brought under test, seminar and assignment framework)

    a. Book review and research paper review, syllabus and curriculum review.
    b. Data collection and paper writing practices: books level, field study level. Using the course study for society and nature development – exercise
    c. Workshops, preparing technical term dictionaries from text books and reference books.

d. Preparing question paper by the candidates: objective type, descriptive type, training can be given by the teacher

e. Forming digital library: collecting text and reference books, course material.

f. Villages, institutions, various people groups may be adopted by the departments of the colleges for practicing their theoretical study. Innovative methods may be implemented in the practices and report can be written for documentation, further discussion and research.

g. Extracurricular and cultural activities may be framed through the syllabus content.

h. Grouping students for self-discussion, self-learning process.

i. Following institution and intellectual and writing reports in the course field.

Text

1. Pradeep Kothari, "Android Application Development (with kitkat support) Black Book", Kogent Learning Solution Inc., Dreamtech Press India Pvt. Ltd, Wiley Publications.

2. Sayed Y. Hashimi, SatyaKomatineni, Dave MacLean, "Pro Android 2", 2010 Edition, Wiley publications.

References

1. Reto Meier ,"Professional Android Application Development",2009 Edition, Willy Publication.

2. ZigurdMednieks, Laird Dornin, G. Blake Meike,and Masumi Nakamura, "Programming Android", OReilly publications.

Web References

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2. www.javatpoint.net
3. www.mkyong.com
4. www.java2s.com

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO2	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO3	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO4	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S
CO5	S	S	S	M	M	S	M	M	M	L	M	S	M	L	S

PO – Programme Outcome, CO – Course outcome

S – Strong, M – Medium, L – Low (may be avoided)