

# **FATIMA COLLEGE (AUTONOMOUS)**



**Re-Accredited with “A” Grade by NAAC (3<sup>rd</sup> Cycle)  
74<sup>th</sup> Rank in India Ranking 2020 (NIRF) by MHRD  
Maryland, Madurai- 625 018, Tamil Nadu, India**

**NAME OF THE DEPARTMENT: INFORMATION TECHNOLOGY**

**NAME OF THE PROGRAMME : B.SC**

**PROGRAMME CODE : USIT**

**ACADEMIC YEAR : 2020-21**

**FATIMA COLLEGE (AUTONOMOUS), MADURAI-18  
DEPARTMENT OF INFORMATION TECHNOLOGY**

**PROGRAMME CODE : USIT**

**PART - I - TAMIL / FRENCH / HINDI- 12 CREDITS**

**PART - I - TAMIL**

**Offered by The Research Centre of Tamil**

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CRE DIT	CIA Mks	ESE Mks	TOT . MKs
1.	I	19TLC1	Language-Modern Literature	5	3	40	60	100
2.	II	19TLC2	Language - Bakthi Literature	5	3	40	60	100
3.	III	19TLC3	Language- Epic Literature	5	3	40	60	100
4.	IV	19TLC4	Language-Sangam Literature	5	3	40	60	100
			<b>Total</b>	<b>20</b>	<b>12</b>			

**PART – I – FRENCH**

Offered by TheDepartment of French

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CRE DIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19RLC1	PART 1 LANGUAGE FRENCH	5	3	40	60	100
2.	II	19RLC2	PART 1 LANGUAGE FRENCH	5	3	40	60	100
3.	III	19RLC3	PART 1 LANGUAGE FRENCH	5	3	40	60	100
4.	IV	19RLC4	PART 1 LANGUAGE FRENCH	5	3	40	60	100
			<b>Total</b>	<b>20</b>	<b>12</b>			

**PART – I – HINDI**

Offered by TheDepartment of Hindi

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CRE DIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19DLC1	PART 1 LANGUAGE HINDI	5	3	40	60	100
2.	II	19DLC2	PART 1 LANGUAGE HINDI	5	3	40	60	100
3.	III	19DLC3	PART 1 LANGUAGE HINDI	5	3	40	60	100
4.	IV	19DLC4	PART 1 LANGUAGE HINDI	5	3	40	60	100
			<b>Total</b>	<b>20</b>	<b>12</b>			

**PART - II - ENGLISH - 12 CREDITS**

**Offered by The Research Centre of English**

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT . MKS
1.	I	19E1LB1	BASIC COMMUNICATIVE ENGLISH	5	3	40	60	100
2.		19E1LI1	INTERMEDIATE COMMUNICATIVE ENGLISH	5	3	40	60	100
3.		19E1LA1	ADVANCED COMMUNICATIVE ENGLISH	5	3	40	60	100
4.	II	19E2LB2	ENGLISH COMMUNICATION SKILLS (BASIC)	5	3	40	60	100
5.		19E2LI2	ENGLISH FOR EMPOWERMENT (INTERMEDIATE)	5	3	40	60	100
6.		19E2LA2	ENGLISH FOR CREATIVE WRITING (ADVANCED)	5	3	40	60	100
7.	III	19ELC3	ENGLISH FOR DIGITAL ERA	5	3	40	60	100
8.	IV	19ELC4	ENGLISH FOR INTEGRATED DEVELOPMENT	5	3	40	60	100
			<b>Total</b>	<b>20</b>	<b>12</b>			

**PART – III -MAJOR, ALLIED & ELECTIVES – 95 CREDITS****MAJOR CORE COURSES INCLUDING PRACTICALS : 60 CREDITS**

S.NO	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	I	1911CC1	FUNDAMENTALS OF COMPUTING	6	4	40	60	100
2.		1911CC2	LAB IN PROGRAMMING IN C	6	3	40	60	100
3.	II	1912CC3	DATA STRUCTURES USING C++	6	4	40	60	100
4.		1912CC4	LAB IN DATA STRUCTURES USING C++	6	3	40	60	100
5.	III	1913CC5	DATABASE MANAGEMENT SYSTEM	6	4	40	60	100
6.		1913CC6	LAB IN RDBMS	6	3	40	60	100
7.	IV	1914CC7	PROGRAMMING IN JAVA	6	4	40	60	100
8.		1914CC8	LAB IN PROGRAMMING IN JAVA	6	3	40	60	100
9.	V	I5CC11	WEB TECHNOLOGY	4	4	25	75	100
10.		I5CC12	LAB IN WEB TECHNOLOGY	5	4	40	60	100
11.		I5CC13	DATA COMMUNICATION AND NETWORKING	5	4	25	75	100

S.NO	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
12.		I5CC14	DATA MINING CONCEPTS	4	4	25	75	100
13.		I5CC15	SOFTWARE ENGINEERING	4	4	25	75	100
14.	VI	I6CC16	.NET PROGRAMMING	5	5	25	75	100
15.		I6CC17	LAB IN .NET PROGRAMMING	4	4	40	60	100
16.		I6CC18	INFORMATION SECURITY	5	4	25	75	100
17.		I6CC19	PROJECT LAB	-	2	40	60	100

### ALLIEDCOURSES

S.NO	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19I1ACG1	DISCRETE MATHEMATICS	5	5	40	60	100
2.	II	19I2ACG2	OPERATIONS RESEARCH	5	5	40	60	100
3.	III	19I3AC3	DIGITAL PRINCIPLES AND COMPUTER ARCHITECTURE	5	5	40	60	100
4.	IV	19I4AC4	OPERATING SYSTEMS	5	5	40	60	100

**ELECTIVES**

S.No	SEM.	COURSECODE	COURSE TITLE	HRS	CR EDI T	CIA Mks	ESE Mks	TOT · Mks
1.	V	I5ME1/I5ME2	INFORMATION STORAGE AND MANAGEMENT / MULTIMEDIA TECHNOLOGIES	5	4	25	75	100
2.	VI	I6ME3/I6ME4	CLOUD COMPUTING/MOBILE COMPUTING	5	4	25	75	100
3.		I6ME5/I6ME6	COMPUTER GRAPHICS/ INTERNET & E-COMMERCE	5	4	25	75	100

**PART – IV – 20 CREDITS**

- **VALUE EDUCATION**
- **ENVIRONMENTAL AWARENESS**
- **NON MAJOR ELECTIVE**
- **SKILL BASED COURSES**

S. No	SEM.	COURSECODE	COURSE TITLE	HR S	CRE DIT	CIA Mks	ESE Mks	TOT. Mks
1.	I	19G1VE	Value Education (Including Meditation in Action Movement)	1	1	40	60	100
2.		19I1NME1	Non Major Elective - Multimedia Applications (Offered to other major Students)	2	2	40	60	100
3.	II	19G2VE	Value Education	1	1	40	60	100
4.		19I2NME2	Non Major Elective - Multimedia Applications (Offered to other major Students)	2	2	40	60	100

S. No	SEM.	COURSE CODE	COURSE TITLE	HR S	CRE DIT	CIA Mks	ESE Mks	TOT. Mks
5.	III	I3EN1	Environmental Education	1	1	40	60	100
6.		19I3SB1	Skill based - Office Automation	2	2	40	60	100
7.	IV	I4EN1	Environmental Education	1	1	40	60	100
8.		19I4SB2	Skill based - Quantitative Aptitude	2	2	40	60	100
9.	V	I5SB3	Skill based - Image Designing Software	2	2	50	50	100
10.		I5SB4	Skill based – Web Designing using Dreamweaver	2	2	50	50	100
11.	VI	I6SB5	Skill based - 3D Animation Software	2	2	50	50	100
12.		I6SB6	Skill based – Image Editing Software	2	2	50	50	100

### **PART – V – 1CREDIT**

#### **OFF-CLASS PROGRAMME**

#### **ALL PART-V**

##### **Shift I**

- Physical Education
- NSS
- NCC
- Women Empowerment Cell
- AICUF

##### **Shift II**

- Physical Education
- Rotaract
- Women Empowerment Cell
- AICUF
- Youth Red Cross / NSS

**Kindly retain your respective Part V**



**OFF-CLASS PROGRAMME****ADD-ON COURSES**

<b>COURSE CODE</b>	<b>Courses</b>	<b>Hrs.</b>	<b>Credits</b>	<b>Semester in which the course is offered</b>	<b>CIA Mks</b>	<b>ES E Mks</b>	<b>Total Marks</b>
	<b>COMPUTER APPLICATIONS</b> (offered by The department of PGDCA for Shift I)	40	2	I&II	40	60	100
	<b>ONLINE SELF LEARNING COURSE-</b> Foundation Course for Arts	40	3	I	50	-	50
	<b>ONLINE SELF LEARNING COURSE-</b> Foundation Course for Science	40	3	II	50	-	50
	<b>ETHICAL STUDIES-Value Education</b>	15	2	III-VI	50 each Semester	-	100
	<b>HUMAN RIGHTS</b>	15	2	V	-	-	100
	<b>OUTREACH PROGRAMME-</b> Reach Out to Society through Action <b>ROSA</b>	100	3	V & VI	-	-	100
	<b>PROJECT</b>	30	4	VI	40	60	100
	<b>READING</b>	10/Semes	1	II-VI	-	-	-

<b>COURSE CODE</b>	<b>Courses</b>	<b>Hrs.</b>	<b>Credits</b>	<b>Semester in which the course is offered</b>	<b>CIA Mks</b>	<b>ES E Mks</b>	<b>Total Marks</b>
	<b>CULTURE</b>	ter					
	<b>MOOC COURSES</b> (Department Specific Courses/any other courses) * Students can opt other than the listed course from UGC-SWAYAM UGC / CEC	-	Minimum 2 Credits	-	-	-	
	<b>TOTAL</b>		22 +				

**EXTRA CREDIT COURSE**

<b>Course Code</b>	<b>Courses</b>	<b>Hrs.</b>	<b>Credits</b>	<b>Semester in which the course is offered</b>	<b>CIA Mks</b>	<b>ESE Mks</b>	<b>Total Marks</b>
19UGSLI1	<b>EMERGING TRENDS IN INFORMATION TECHNOLOGY</b>	-	2		40	60	100

**I B.Sc.  
SEMESTER –I**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	19I1CC1	FUNDAMENTALS OF COMPUTING	Lecture	6	4

**COURSE DESCRIPTION**

This course content plays a vital role in building the basic concepts in computers and the fundamental knowledge in programming.

**COURSE OBJECTIVES**

To impart knowledge on basic concepts in Computer and to demonstrate the fundamental programming techniques in C.

**UNITS**

**UNIT –I INTRODUCTION TO COMPUTER SYSTEM (17 HRS.)**

Characteristics of Computers, History of Computers, Computer System. Hardware & Software: Components of Hardware, Software, Features of Software, Difference between Hardware & Software, types of software and open source software. Components of Computer and their Functions: **Input Unit, Output Unit (Self Study)**. Storage Unit & CPU: Primary, Secondary and CPU. Blu-Ray Technology. Digital rights management (DRM).

**INTRODUCTION TO C:**

Overview of C: Introduction – Importance of C – Sample C Program – Basic Structure of C Program – Programming Style – Executing a C Program. Keywords and Identifiers – Constants – Variables – Data types – Declaration of Variables – Assigning values to variables – Defining symbolic constants – Operators and Expressions

**UNIT –II DECISION-MAKING STATEMENTS (17 HRS.)**

Decision Making and Branching: Introduction – Decision making with IF statement- Simple IF statement- the IF-Else statement- Nesting of If-Else statement- The Else-if ladder- The switch statement- The ?: operator- **The Go to statement(Self Study).**

Decision Making and Looping: Introduction – The While statement- The Do statement – The For statement – Jumps in loops.

**UNIT –III ARRAYS ,STRUCTURES & UNIONS (17 HRS.)**

Arrays : Introduction – One Dimensional arrays – Two Dimensional Arrays- Initializing Two dimension Arrays – Multi Dimensional arrays

Structures & Unions : Introduction – Defining Structures- Declaring Structure Variables – Accessing Structure Members - Structure Initialization- **Unions (Self Study).**

**UNIT –IV FUNCTIONS (17 HRS.)**

User Defined Functions: Definitions of Functions – Return Values and their types – Function Calls –Function Declarations – Category of Functions – Nesting of Functions – Recursion- Passing Arrays to Functions –**Passing Strings to Functions (Self Study).**

**UNIT –V POINTERS AND FILE MANAGEMENT (17 HRS.)**

Pointers : Introduction – Accessing the Address of a Variable – Declaring pointer variable – Pointers and Arrays- Array of Pointers – Pointers as Function Arguments – Functions Returning Pointers – Pointers to Functions – **Pointers and Structures(Self Study).**

File Management in C: Introduction – Defining and Opening a file – Closing file- Input Output operations on files – Error Handling during I/O operations – Random Access to files.

**UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5HRS.)**

Real- time Applications using C

**TEXT BOOKS:**

1. Norton, Peter. Introduction to computers. McGraw-Hill Education, 2006.
2. Balagurusamy, E. Programming in ANSI C , 7e. Tata McGraw-Hill Education, 2018. ( Chapters: 1, 2, 3, 5, 6, 7, 9, 10, 12)

**REFERENCES:**

1. Byron Gottfried, “Programming with C”, 2nd edition, (Indian Adapted Edition), TMH Publication.
2. Yashavant Kanetkar, “Let us C”, 16th Edition, BPB publication, 2017

**WEB REFERENCES:**

1. C Tutorial - Learn C Programming - W3schools.in  
<https://www.w3schools.in/c-tutorial>.
2. C Tutorial  
<https://www.tutorialspoint.com/cprogramming/index.htm>

**COURSE OUTCOMES**

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

S.NO.	COURSE OUTCOMES
CO 1	Understand the basic concepts in Computer & C Programming.
CO 2	Identify and Apply different construct available for iteration such as ‘for’, ‘while’ and ‘do-while’.
CO 3	Understand various storage concepts.
CO 4	Develop C programs using functions.
CO 5	Summarize the concepts of Pointers and Files.

**I B.Sc.  
SEMESTER -I**

<b>PROGRAMM E CODE</b>	<b>COURS E CODE</b>	<b>COURSE TITLE</b>	<b>CATEGOR Y</b>	<b>HRS/WEE K</b>	<b>CREDIT S</b>
<b>USIT</b>	<b>19I1CC 2</b>	<b>LAB I - PROGRAMMIN G IN C</b>	<b>Practical</b>	<b>6</b>	<b>3</b>

**COURSE DESCRIPTION**

This course content plays a vital role in building the basic programming skill in C language.

**COURSE OBJECTIVES**

To develop problem solving skill by using various concepts in C language.

**PROGRAM LIST**

1. Program using input and output statements.
2. Program using Operators.
3. Program using Conditional Statements.
4. Program using Switch Case Statements.
5. Program using Looping Statements.
6. Programs for Array Manipulations.
7. Program using String Functions
8. Program using Functions.
9. Program using Recursion.
10. Program using Structures
11. Program using Unions.
12. String Manipulation Programs
13. Program using Pointers

14. File Manipulation Programs

15. Command line arguments

### **COURSE OUTCOMES**

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

<b>NO.</b>	<b>COURSE OUTCOMES</b>
CO 1	Know the concept of Problem solving.
CO 2	Implement various concepts in C.
CO 3	Apply the concepts of Functions, Structures and Unions in C program
CO 4	Make use of pointers using C programs.
CO 5	Apply and Use the file concepts in C programs.

**I B.Sc.  
SEMESTER -I**

PROGRAMM E CODE	COURSE CODE	COURSE TITLE	CATEGOR Y	HRS/WEE K	CREDIT S
USIT	1911ACG 1	DISCRETE MATHEMATIC S	Lecture	6	4

**COURSE DESCRIPTION**

This course content is enables students to strengthen and increase the understanding of Discrete Mathematics with special emphasis on Computer science applications.

**COURSE OBJECTIVES**

To impart the mathematical skill to develop logical thinking.

**UNITS**

**UNIT -I SETS, RELATIONS (17 HRS.)**

Sets – Definition- Venn Diagram- Operations on sets Properties of Relations- Inverserelation- Equivalence classes- Partition of a set- Fundamental theorem on equivalencerelations- Graphs of relations and Hasse Diagram.

**UNIT -II LOGIC (17 HRS.)**

Connectives- Equivalence Formulas- Tautological Implication- Normal Forms- InferenceTheory- Predicate Calculus-Inference theory for Predicate Calculus.

**UNIT -III THEORY OF MATRICES (17 HRS.)**

Matrix Inversion- System of equations- Consistency of systems of linear equations- EigenValues- Eigen Vectors- Digitalization Process- Induction Principle- Peano's Postulates.



**UNIT –IV RECURRENCE RELATIONS AND GENERATING FUNCTIONS****(17 HRS.)**

Polynomial expression- Sequences- Recurrence relations- Generating Functions- Properties of Generating Functions- Solution of Recurrence Relations using Generating Functions.

**UNIT –V BOOLEAN ALGEBRA****(17 HRS.)**

Boolean Algebra- Simplification of Boolean Functions by the map method - Introduction to the Applications of Boolean Algebra to Switching Theory- Turing Machine Problem.

**UNIT –VI DYNAMISM (Evaluation Pattern-CIA only)****(5 HRS.)****TEXT BOOK:**

1. V Sundaresan, K S Ganapathy Subramanian, K Ganesan, Discrete mathematics, A.R. Publications, 2002. Chapters: 1(excluding Functions), 2, 3, 6(excluding 6.1, 6.2).

**REFERENCES:**

1. Doerr, Alan, and Kenneth Levasseur. Applied discrete structures for computer science. Galgotia Publications, New Delhi.
2. J P Tremblay and R Manohar, Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw-Hill Publishing Company Limited.

**WEB REFERENCES:**

1. Discrete Mathematics Tutorial

[https://www.tutorialspoint.com/discrete\\_mathematics/index.htm](https://www.tutorialspoint.com/discrete_mathematics/index.htm)

**COURSE OUTCOMES**

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

<b>NO.</b>	<b>COURSE OUTCOMES</b>
CO 1	Understand the basic principles of sets and operations in sets.
CO 2	Write arguments using logical notation.
CO 3	Implement various concepts in theory of Matrices
CO 4	Demonstrate an understanding of relations and functions and be able to determine their properties.
CO 5	Write the diversified solutions for various recurrence relations and Boolean algebra.

**I B.Sc.**  
**SEMESTER -I**

<b>PROGRAMM E CODE</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>CATEGOR Y</b>	<b>HRS/WEE K</b>	<b>CREDIT S</b>
<b>USIT</b>	<b>19I1NME 1</b>	<b>MULTIMEDIA APPLICATION S</b>	<b>Practical</b>	<b>2</b>	<b>2</b>

**COURSE DESCRIPTION**

This course content is enables other disciplined students to strengthen and increase the understanding of basis Multimedia application software like Photoshop and Corel Draw.

**COURSE OBJECTIVES**

To impart, practical knowledge on various editing techniques in Photoshop and Corel draw.

**UNITS**

**UNIT -I BASICS OF CORELDRAW (6HRS.)**

Introduction-Getting Started-Creating A New File - Title Bar-Menu Bar- Tool Bar - Work Area-Views. TEXT Introduction-Text Tool-Converting Text-Formatting Text- Webdings Changing the Alignment-Applying Effects

**UNIT -II IMAGE& LAYOUT (6 HRS.)**

Bitmap Images-Vector Image-Resizing-Rotating-Skewing-Moving-Cropping-Importing Images-Adding Special Effects-Converting to Bitmap-Exporting Images.PAGE LAYOUT: Changing the Page Size-Changing the Layout- Changing the Background.

**UNIT -III PHOTOSHOP : SELECTION AND PAINTING TOOLS (6 HRS.)**

Marquee Tool-Crop Tool-Lasso Tool-Move Tool, Rubber/clone Stamp tool-Eraser Tool-Paint Brush Tool-Art History/History Brush Tool-Text Tool.

**UNIT –IV TRANSFORMATIONS****(6 HRS.)**

Resizing: Resizing an image- Resizing a canvas- Resizing a selection Rotating: Rotate 180 degrees and 90 degrees clockwise or counter clockwise- Rotate by degrees- Rotate a selection.

**UNIT –V FILTERS****(6 HRS.)**

Sharpen Filters: Sharpen, Sharpen more, Blur Filters: Blur, Blur-more, Distort Filters: Pinch(Squeezing, bulging), Pixellate Filters: crystallize, Extracting an part of image from background image.

**LAB EXERCISE**

1. Drawing Basic Shapes
2. Text Effect
3. Effects
4. Image Editing
5. Layout and Page Size Change
6. Tools
7. Resizing Image
8. Rotating Image
9. Filters

**REFERENCES:**

1. Kumar Bittu, “Adobe Photoshop”, ISBN: 978-9350570166, V&S Publishers.
2. Photoshop 7 Complete reference , ISBN 978-0072223118 - Greenberg – McGraw Hill Publications.

**WEB REFERENCES:**

1. Photoshop Online Training  
[https://www.tutorialspoint.com/photoshop\\_online\\_training/index.asp](https://www.tutorialspoint.com/photoshop_online_training/index.asp)
1. [https://www.entheosweb.com/tutorials/coreldraw/liquid\\_lex/default.asp](https://www.entheosweb.com/tutorials/coreldraw/liquid_lex/default.asp)

**COURSE OUTCOMES**

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

<b>NO.</b>	<b>COURSE OUTCOMES</b>
CO 1	Construct simple vector graphics using basic drawing elements and shape commands.
CO 2	Apply basic shape commands and image effects in processing raster format pictures
CO 3	Understand the basic tools for editing images.
CO 4	Develop effective graphics for both web and print media.
CO 5	Apply layer features and layer management techniques for creating Web pages and Invitations.

**I B.Sc.**  
**SEMESTER -II**

PROGRAMM E CODE	COURS E CODE	COURSE TITLE	CATEGOR Y	HRS/WE K	CREDIT S
USIT	19I2CC 3	DATA STRUCTURE S USING C++	Lecture	6	4

### COURSE DESCRIPTION

This course introduces the basic concepts of C++. It also aims at facilitate the students to know the Data Structure concepts.

### COURSE OBJECTIVES

To impart Technical and Practical knowledge in Object oriented Programming with C++ & Data Structures.

### UNITS

#### UNIT -I OBJECT ORIENTED CONCEPTS (17 HRS.)

Classes and Objects: Specifying a class Defining Member functions- A C++ Program with Class-Making an Outside function Inline – Nesting of Member Function - Memory allocation for objects- Static Data Members & Member Functions - Array of Objects - Friendly functions- Local Classes. Constructors and Destructors: Constructors- Parameterized Constructors- Multiple Constructors in Class- **copy constructors- Dynamic Constructors(Self Study)**- Destructors.

#### UNIT -II OPERATOR OVERLOADING & INHERITANCE (17 HRS.)

Defining operator overloading - Overloading unary operators-Overloading binary operators-using friend function -manipulation of strings using operators-rules for overloading operators- Extending Classes: Introduction- Defining derived classes-single inheritance- Multiple Inheritance-Multilevel Inheritance-**Hierarchical inheritance- Hybrid Inheritance(Self Study)**- Virtual Base classes- Abstract Classes- Constructor in Derived Classes-

Member Classes: Nesting of Classes.

**UNIT –III POINTERS, VIRTUAL FUNCTIONS & POLYMORPHISM (17 HRS.)**

Pointers: Pointers to Objects – This Pointers – Pointers to Derived Class – Virtual Functions- Pure virtual function - **Virtual Constructors and Destructors (Self Study)**. DATA STRUCTURES: Introduction to Data Structures – Types of Data Structures - Data Structures Operations.

**UNIT –IV LINKED LIST, STACKS & QUEUES (17 HRS.)**

Linked List –Basic Concepts – Linked List Implementation – Types of Linked List- Circular Linked List – Doubly Linked List – Stack – Stack Operations – Stack Implementation – Queue – Basic Concepts –Queue Operations –Queue Implementations - Circular queues –Priority Queue – **Double Ended Queues (Self Study)**.

**UNIT –V TREES, GRAPH, SEARCHING AND SORTING (17 HRS.)**

Trees: Basic Concepts - Binary trees – Binary Tree Representation - Binary tree Traversal - Binary Search tree – Tree Variants – Graphs - Basic Concept – Graph Terminology – Graph Implementation- Shortest Path Algorithm – **Graph Traversal( Self Study)** - Sorting Techniques – Searching Techniques

**UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 HRS.)**

Real- time Applications using C++

**TEXT BOOK:**

1. Balagurusamy, E. Object Oriented Programming and Data Structures, Tata McGraw-Hill Education, 2015. Chapters 4,6, 7,8,9,10,12,13,14,15,16,17

**REFERENCES:**

1. Dewhurst, Stephen C., and Kathy T. Stark. Programming in C++. Prentice-Hall, Inc., 1989.
2. Lafore, Robert. Object-oriented programming in Turbo C++. Galgotia publications, 2001.
3. Allen, Weiss Mark. Data structures and algorithm analysis in C++. Pearson Education India, 2007.

**WEB REFERENCES:**

1. Data Structure and Algorithms Tutorial  
[https://www.tutorialspoint.com/data\\_structures\\_algorithms/index.htm](https://www.tutorialspoint.com/data_structures_algorithms/index.htm)
2. Introduction To Data Structure  
<https://www.w3schools.in/data-structures-tutorial/intro/>
3. C++ Tutorial  
<https://www.tutorialspoint.com/cplusplus/index.htm>
4. C++ Tutorials and Resources  
<https://www.w3schools.in/category/cplusplus-tutorial/>

**COURSE OUTCOMES**

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

NO.	COURSE OUTCOMES
CO 1	Understand how to apply the major OOPs concepts to implement encapsulation, inheritance and polymorphism.
CO 2	Implement an achievable practical application and analyze issues related to object-oriented techniques in the C++ programming language
CO 3	Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
CO 4	Use linear and non-linear data structures like Stacks, Queues, and Linked List.
CO 5	Analyze various Searching and Sorting Techniques using C++.



**I B.Sc.**  
**SEMESTER -II**

<b>PROGRAMME CODE</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>CATEGORY</b>	<b>HRS/WEEK</b>	<b>CREDITS</b>
<b>USIT</b>	<b>19I2CC4</b>	<b>LAB -II - DATA STRUCTURES USING C++</b>	<b>Practical</b>	<b>6</b>	<b>3</b>

**COURSE DESCRIPTION**

This course enables students to identify, formulate all techniques of software development in the C++ Programming Language and demonstrate these techniques.

**COURSE OBJECTIVES**

To give programming skills on various concepts in Data Structures using C++ programs.

**PROGRAM LIST**

1. Programs using operators, decision making statements and looping statements.
2. Program using Classes and Objects
3. Program using Inline Functions.
4. Program using Functions with default arguments
5. Program using Polymorphism
6. Program using Constructors
7. Program using Destructors
8. Program using Inheritance & Its types
9. Program using Operator overloading
10. Program using Friend Functions.
11. Program for Stack Implementation
12. Program for Queue Implementation
13. Program for Linked List Implementation
14. Program for Binary Tree traversal
15. Program for Searching Techniques

## 16. Program for Sorting Techniques

**COURSE OUTCOMES**

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

<b>NO.</b>	<b>COURSE OUTCOMES</b>
CO 1	Implement an achievable practical application on object-oriented techniques in the C++ programming language.
CO 2	Implement linear and non-linear data structures like Stacks, Queues, linked list.
CO 3	Demonstrate the concept of classes and their types by using C++ objects.
CO 4	Apply the concept of polymorphism and inheritance in C++.
CO 5	Implement practical applications by applying Searching and Sorting Techniques using C++.

**I B.Sc.**  
**SEMESTER -II**

PROGRAMM E CODE	COURSE CODE	COURSE TITLE	CATEGOR Y	HRS/WEE K	CREDIT S
USIT	19I2ACG 2	OPERATION S RESEARCH	Lecture	5	5

**COURSE DESCRIPTION**

This course content helps in solving problems in different environments using Linear Programming methodologies.

**COURSE OBJECTIVES**

To impart the mathematical skill to develop logical thinking.

**UNITS**

**UNIT -I LINEAR PROGRAMMING PROBLEM - MATHEMATICAL FORMULATION (17 HRS.)**

Introduction - Linear Programming Problem - Mathematical Formulation of the Problem - Illustration on Mathematical Formulation of LPPs, Linear Programming Problem- Graphical Solution: Introduction - Graphical Solution Method - General Linear Programming problem.

**UNIT -II LINEAR PROGRAMMING - SIMPLEX METHOD (17 HRS.)**

Introduction - Fundamental Properties of Solutions - The Computational Procedure - Use of Artificial Variables - Degeneracy in Linear Programming - Solution of Simultaneous Linear Equations - Inverting a Matrix Using Simplex Method - Application of Simplex Method.

**UNIT -III DUAL PROBLEM (17 HRS.)**

Primal-Dual Pair in Matrix Form - Duality Theorems - Complementary Slackness Theorem - Duality and Simplex Method - Economic Interpretation of Duality - Dual Simplex Method.

**UNIT –IV TRANSPORTATION PROBLEM (17 HRS.)**

Introduction - LP Formulation of the Transportation Problem - Existence of Solution in T.P. - Duality in Transportation Problem - The Transportation Table - Loops in Transportation Tables - Triangular Basis in a T.P. - Solution of a Transportation Problem - Finding an Initial Basic Feasible Solution - Test for Optimality

**UNIT –V ASSIGNMENT PROBLEM (17 HRS.)**

Introduction - Mathematical Formulation of the Problem - Solution Methods of Assignment Problem - Special Cases in Assignment Problem - Dual of the Assignment Method – The Travelling Salesman Problem.

**UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 HRS.)****TEXT BOOK:**

1. Gupta, S. C., and V. K. Kapoor. "Fundamentals of Mathematical Statistics, Ninth Extensively Revised Edition, Sultan Chand & Sons." (1997).Chapter: 2, 3, 4, 5, 10, 11

**REFERENCES:**

1. V.Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan."Operations Research", ARS Publications, 2003.
2. Hamdy A Taha," Introduction to Operations Research", Prentice Hall India,Seventh Edition, Third Indian Reprint 2004.

**WEB REFERNCES :**

1. Operations Research - Suny Binghamton University  
[https://www.youtube.com/playlist?list=PLgA4wLGrqI-1l9OSJmR5nU4lV4\\_aNTgKx](https://www.youtube.com/playlist?list=PLgA4wLGrqI-1l9OSJmR5nU4lV4_aNTgKx)

**COURSE OUTCOMES**

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

<b>NO.</b>	<b>COURSE OUTCOMES</b>
CO 1	Identify and develop operational research models from the verbal description of the real system.
CO 2	Understand simplex, dual problem.
CO 3	Understand the mathematical tools that are needed to solve the optimization problems.
CO 4	Write diversified solutions for various Transportation problems.
CO 5	Analyze assignment problems.

**I B.Sc.  
SEMESTER -II**

<b>PROGRAMM E CODE</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>CATEGOR Y</b>	<b>HRS/WEE K</b>	<b>CREDIT S</b>
<b>USIT</b>	<b>19I2NME 2</b>	<b>MULTIMEDIA APPLICATION S</b>	<b>Practical</b>	<b>2</b>	<b>2</b>

**COURSE DESCRIPTION**

This course content is enables other disciplined students to strengthen and increase the understanding of basis Multimedia application software like Photoshop and Corel Draw.

**COURSE OBJECTIVES**

To impart, practical knowledge on various editing techniques in Photoshop and Corel draw.

**UNITS**

**UNIT -I BASICS OF CORELDRAW (6HRS.)**

Introduction-Getting Started-Creating A New File - Title Bar-Menu Bar- Tool Bar - Work Area-Views. TEXT Introduction-Text Tool-Converting Text-Formatting Text- Webdings Changing the Alignment-Applying Effects

**UNIT -II IMAGE& LAYOUT (6 HRS.)**

Bitmap Images-Vector Image-Resizing-Rotating-Skewing-Moving-Cropping-Importing Images-Adding Special Effects-Converting to Bitmap-Exporting Images.PAGE LAYOUT: Changing the Page Size-Changing the Layout-Changing the Background.

**UNIT -III PHOTOSHOP : SELECTION AND PAINTING TOOLS (6 HRS.)**

Marquee Tool-Crop Tool-Lasso Tool-Move Tool, Rubber/clone Stamp tool-Eraser Tool-Paint Brush Tool-Art History/History Brush Tool-Text Tool.

**UNIT –IV TRANSFORMATIONS****(6 HRS.)**

Resizing: Resizing an image- Resizing a canvas- Resizing a selection Rotating: Rotate 180 degrees and 90 degrees clockwise or counter clockwise- Rotate by degrees- Rotate a selection.

**UNIT –V FILTERS****(6 HRS.)**

Sharpen Filters: Sharpen, Sharpen more, Blur Filters: Blur, Blur-more, Distort Filters: Pinch(Squeezing, bulging), Pixellate Filters: crystallize, Extracting an part of image from background image.

**LAB EXERCISE**

1. Drawing Basic Shapes
2. Text Effect
3. Effects
4. Image Editing
5. Layout and Page Size Change
6. Tools
7. Resizing Image
8. Rotating Image
9. Filters

**REFERENCES:**

1. Kumar Bittu, “Adobe Photoshop”, ISBN: 978-9350570166, V&S Publishers.
2. Photoshop 7 Complete reference , ISBN 978-0072223118 - Greenberg – McGraw Hill Publications.

**WEB REFERNCES :**

1. Photoshop Online Training  
[https://www.tutorialspoint.com/photoshop\\_online\\_training/index.asp](https://www.tutorialspoint.com/photoshop_online_training/index.asp)
2. [https://www.entheosweb.com/tutorials/coreldraw/liquid\\_lex/default.asp](https://www.entheosweb.com/tutorials/coreldraw/liquid_lex/default.asp)

**COURSE OUTCOMES**

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

<b>NO.</b>	<b>COURSE OUTCOMES</b>
CO 1	Construct simple vector graphics using basic drawing elements and shape commands.
CO 2	Apply basic shape commands and image effects in processing raster format pictures
CO 3	Understand the basic tools for editing images.
CO 4	Develop effective graphics for both web and print media.
CO 5	Apply layer features and layer management techniques for creating Web pages and Invitations.



**II B.Sc.**  
**SEMESTER -III**

PROGRAM ME CODE	COURS E CODE	COURSE TITLE	CATEGO RY	HRS/WE EK	CREDI TS
USIT	19I3C C5	DATABASEMANAGE MENT SYSTEMS	Lecture	6	4

**COURSE DESCRIPTION**

This course introduces database design and creation using DBMS software. It also imparts various concepts in database management system.

**COURSE OBJECTIVES**

To facilitate the student to understand the various functionalities of DBMS software and perform many operations related to creating, manipulating and maintaining databases for Real-world applications.

**UNITS**

**UNIT -I DATABASES**

**(17 HRS.)**

Purpose of database systems - View of data- Database languages – Relational Databases – Database Design - Data Storage and Querying – Transaction Management- Database Architecture - Data mining and Information Retrieval – Specialty Databases - Analysis — Database users and Administrators. Relational Model - Structure of relational databases – Database Schema – Keys – Schema Diagram – **Relational Operations (Self Study).**

**UNIT -II SQL**

**(17 HRS.)**

Background – Data Definition - Basic structure of SQL Queries - Set operations - Aggregate functions - Null values -nested sub queries – Complex Queries - Views - Modifications of the database – Joins – Views - relations - Embedded SQL – Dynamic SQL – SQL Functions and **procedures(Self Study).**

**UNIT –III DATABASE DESIGN (17 HRS.)**

Normalization - Atomic Domains and First Normal Form –Decomposition - Functional Dependencies - Multivalued Dependencies - Normal forms

**UNIT –IV RELATIONAL QUERY LANGUAGES AND E-R MODEL (17 HRS.)**

Algebra - The Tuple Relational Calculus - The Domain Relational Calculus - E-R Model - Constraints - E- R Diagram - **Extended E - R Features ( Self Study) .**

**UNIT –V PL/SQL (17 HRS.)**

Introduction - The generic PL/SQL Block - The PL/SQL execution environment – PL/SQL - Control Structure. Introduction to cursors - Cursor FOR loops. Advantages of using Procedure or Function - Procedures versus Functions - Database triggers - **Deleting a trigger (Self Study).**

**UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 HRS.)**

Multidimensional databases - Mobile databases - Multimedia databases

**TEXT BOOK:**

1. Silberschatz, Abraham, Henry F. Korth, and S. Sudarshan." Database System Concepts.", 6th edition, McGraw Hill Education Private Limited (2016).chapters 1, 2, 3, 4, 5, 6, 7, 8
2. Bayross, Ivan. SQL, PL/SQL: The programming language of Oracle.BPB publications, 2010.chapters 15, 16, 18

**REFERENCES:**

1. Leon, Alexis, and Mathews Leon.Database management systems. Vikas Publishing House Pvt. Limited, 2010.
2. Elmasri, R., &Navathe, S. B. (2011).Database systems.Boston, MA: Pearson Education.

**WEB REFERNCES :**

1. Dbms Tutorial: Database Management System - Javatpoint  
<https://www.javatpoint.com/dbms-tutorialIntroduction To Data Structure>

## 2. Database Management System Tutorial - Tutorialspoint

<https://www.tutorialspoint.com/dbms/index.htm>

**COURSE OUTCOMES**

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

<b>NO.</b>	<b>COURSE OUTCOMES</b>
CO 1	Explain the structure and model of the relational database system.
CO 2	Design multiple tables and use group functions, sub queries.
CO 3	Design a database based on a data model considering the normalization to a specified level.
CO 4	Develop E- R model based tables.
CO 5	Evaluate different PL/SQL blocks.

**II B.Sc.**  
**SEMESTER -III**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	19I3CC6	LAB III - RDBMS	Practical	6	3

**COURSE DESCRIPTION**

This course gives hands on experience in relational database management system.

**COURSE OBJECTIVES**

To facilitate the students with hands on training on SQL to design Databases. It also gives an exposure to database design and E-R Modeling.

**PROGRAM LIST**

1. DDL Commands
2. DML Commands
3. DCL Commands
4. TCL Commands
5. Programs on Mathematical functions.
6. Programs on string functions.
7. Programs on Aggregate functions.
8. Programs on Date functions.
9. Program using Data Constraints like Primary Key, Foreign key, check constraints.
10. Programs on Sub queries
11. Programs on Nested queries
12. Programs on Group by and Order by
13. Implementing the concepts of Joins
14. Programs using decision making and looping statements.
15. PL/SQL program using Cursors
16. PL/SQL program using Cursors and Loops

17. PL/SQL program using triggers.

18. Programs using Forms

## **COURSE OUTCOMES**

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

<b>NO.</b>	<b>COURSE OUTCOMES</b>
CO 1	Explain Various SQL Commands.
CO 2	Write SQL queries to user specifications.
CO 3	Design database schema considering normalization and relationships within database.
CO 4	Develop PL/SQL Programs.
CO 5	Develop triggers, procedures and Cursors.

**II B.Sc.**  
**SEMESTER -III**

PROGRAMM E CODE	COURS E CODE	COURSE TITLE	CATEGOR Y	HRS/WE K	CREDIT S
USIT	19I3AC 3	DIGITAL PRINCIPLES AND COMPUTER ARCHITECTUR E	Lecture	6	4

**COURSE DESCRIPTION**

The course content plays a vital role in making the students to understand the basic digital components.

**COURSE OBJECTIVES**

To make the student familiar with digital logic, data representation and functional design of arithmetic and logic unit that is capable of performing arithmetic operations and floating point operations.

**UNITS**

**UNIT –I DIGITAL LOGIC CIRCUITS (17 HRS.)**

Digital Computers- Logic Gates- Boolean algebra: Complement of a Function -K-Map Simplification: Product of Sum Simplification- Don't Care Condition. Combinational Circuits: Half Adder- Full Adder. Flip- Flops: SR Flip Flop- D Flip Flop - JK Flip Flop - T Flip Flop -**Edge Triggered Flip Flops (Self Study).**

**UNIT –II DATA REPRESENTATION (17 HRS.)**

Data Types: Number Systems- Octal and Hexadecimal Numbers- Decimal Representation- Alphanumeric Representation. Complements:1's Complement- 2's Complement- Subtraction of Unsigned Numbers. Fixed-Point Representation: Integer Representation-Arithmetic Addition- Arithmetic Subtraction -Overflow- Decimal Fixed Point Representation.**Floating Point Representation - Other Binary Codes (Self Study)**- Error Detection Codes.

**UNIT –III DIGITAL COMPONENTS (17 HRS.)**

Integrated Circuits – Decoders - Encoders – Multiplexers - Registers - Shift Register - Binary Counters. Memory Unit: Random - Access Memory - Read Only Memory - **Types of ROMs (Self Study)**. General Register Organization: Control Word - Examples of Micro operations - Stack Organization- Reverse Polish Notation - Evaluation of Arithmetic Expression

**UNIT –IV CENTRAL PROCESSING UNIT (17 HRS.)**

Instruction formats: Three Address Instruction - Two Address Instruction – One Address Instruction- Zero Address Instructions - RISC Instruction - Addressing Modes: Types. Data Transfer and Manipulation: Data Transfer Instruction - Data Manipulation Instructions - Arithmetic Instruction – Logical and Bit Manipulation Instructions - Shift Instruction – Program Control : Program Interrupts - Types of Interrupt- Reduced Instruction Set Computer: **CISC Characteristics- RISC Characteristics(Self Study)**.

**UNIT –V MEMORY ORGANIZATION (17 HRS.)**

Memory Hierarchy - Main Memory: RAM and ROM Chips. Auxiliary Memory: **Magnetic Disks- Magnetic Tape(Self Study)** - Associative Memory. Cache Memory: Associative Mapping - Direct Mapping – Set Associative Mapping. Virtual Memory: Address Space and Memory Space.

**UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 HRS.)**

Recent Development computer architecture.

**TEXT BOOK:**

1. Mano, M. Morris. Computer system architecture. Prentice-Hall of India, 2013. Chapter 1.1 - 1.6, 3.1 - 3.6, 2.1-2.7, 8.1- 8.8, 12.1-12.6

**REFERENCES:**

1. Dasgupta, Subrata. Computer Architecture: A Modern Synthesis. Volume 1, Foundations. John Wiley & Sons, 1989.
2. Hwang, Kai, and Faye A. Briggs. Computer architecture and parallel processing. McGraw-Hill, 1985.

**WEB REFERNCES :**

1. Binary Numbers Representation - Tutorialspoint  
[https://www.tutorialspoint.com/.../digital\\_circuits\\_binary\\_numbers\\_representation.htm](https://www.tutorialspoint.com/.../digital_circuits_binary_numbers_representation.htm)
2. Digital Electronics and Logic Design Tutorials - Geeksforgeeks  
<https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials>

**COURSE OUTCOMES**

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

<b>NO.</b>	<b>COURSE OUTCOMES</b>
CO 1	Explain about digital logic circuits.
CO 2	Compute simple arithmetic operations for fixed-point and floating-point addition and subtraction.
CO 3	Understand various digital components.
CO 4	Construct an instruction set capable of performing a specified set of operations.
CO 5	Demonstrate a memory system for a given set of specifications.



**II B.Sc.  
SEMESTER -III**

<b>PROGRAMM E CODE</b>	<b>COURS E CODE</b>	<b>COURSE TITLE</b>	<b>CATEGOR Y</b>	<b>HRS/WE K</b>	<b>CREDIT S</b>
<b>USIT</b>	<b>19I3SB 1</b>	<b>OFFICE AUTOMATIO N</b>	<b>Practical</b>	<b>2</b>	<b>2</b>

**COURSE DESCRIPTION**

This course trains students how to use MS Office applications use in office work such as creating professional-quality documents, store, organize and analyze information, arithmetic operations, functions and create dynamic slide presentations with animation, narration, images, and much more, digitally and effectively.

**COURSE OBJECTIVES**

To impart knowledge on various concepts in MS Word, Excel, PowerPoint & Publisher.

**UNITS**

**UNIT -I WORD**

**(6HRS.)**

Windows Basics – Introduction to word – Editing a document - Move and Copy text - Formatting text & Paragraph – Enhancing document – Columns, Tables and Other features.

**UNIT -II EXCEL**

**(6 HRS.)**

Introduction to worksheet – getting started with Excel – Editing cell & using Commands and functions – Moving & Copying , Inserting & Deleting Rows & Columns - Printing work sheet.

**UNIT -III ADVANCED FEATURES IN EXCEL**

**(6 HRS.)**

Creating charts – Naming ranges and using statistical, math and financial

functions, in a worksheet – Additional formatting commands and toolbar – other commands & functions.

#### **UNIT –IV POWERPOINT**

**(6 HRS.)**

Overview of Power point – presenting shows for corporate and commercial using Power point

#### **UNIT –V ADVANCED FEATURES OF POWER POINT**

**(6 HRS.)**

Formatting text and objects to customize the look of publication- Add, Resize, Rotate, and Group objects- Creation of Product Catalogue- Create bookmarks and hyperlinks.

#### **PROGRAM LIST**

##### **MS-WORD**

1. **Text Manipulation:** Writing a paragraph about the institution and Change the font size and type, Spell check, Aligning and justification of Text
2. **Bio data:** Preparing Bio-data.
3. **Find and Replace:** Writing a paragraph about individual and do the following. Find and Replace, Use Numbering Bullets, Footer and Headers.
4. **Tables and manipulation:** Creation, Insertion, Deletion (Columns and Rows). Create a mark sheet.
5. **Mail Merge:** Prepare an invitation to invite friends for birthday party. Prepare at least five letters.

##### **MS-EXCEL**

1. Data sorting-Ascending and Descending (both numbers and alphabets)
2. Mark list preparation for a student
3. Individual Pay Bill preparation.
4. Invoice Report preparation.
5. Drawing Graphs. Take your own table.

**MS-POWERPOINT**

1. Create a slide show presentation for a seminar.
2. Preparation of Organization Charts
3. Create a slide show presentation to display percentage of marks in each semester for allstudents
4. Use bar chart(X-axis: Semester, Y-axis: % marks).
5. Use different presentation template different transition effect for each slide.

**REFERENCES:**

1. Holden, Greg. Microsoft Office 2007 in Simple Steps.Prentice Hall Press, 2009.

**WEB REFERNCES :**

1. Free Microsoft Office Tutorials At Gcfglobal  
<https://edu.gcfglobal.org/en/subjects/office/>

**COURSE OUTCOMES**

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

NO.	COURSE OUTCOMES
CO 1	Use Word to prepare organizational documents.
CO 2	Design financial & other business applications requiring mathematical calculations using spread sheet software.
CO 3	Develop various charts--pie, bar, line, column, & area using spread sheet software.
CO 4	Create Dynamic presentations with animation.
CO 5	Demonstrate presentations with narration and images.

**II B.Sc.**  
**SEMESTER -IV**

PROGRAMM E CODE	COURS E CODE	COURSE TITLE	CATEGOR Y	HRS/WEE K	CREDIT S
USIT	19I4CC 7	PROGRAMMIN G IN JAVA	Lecture	6	4

**COURSE DESCRIPTION**

This course enable the students to build object oriented java programs using the concept of abstraction, encapsulation, exception handling, packages, interfaces, threads and AWT controls. It also imparts the ability to develop projects in java with JDBC connectivity.

**COURSE OBJECTIVES**

To acquaint the students with various techniques of Java Programming and help them to create effective programs in this language.

**UNITS**

**UNIT -I CLASSES & OBJECTS (17 HRS.)**

Class fundamentals-Declaring objects-Assigning object reference variables-introducing methods-Constructors-this keyword-finalize() method-overloading methods-using object as parameters-Argument passing-returning object-Recursion- Nested & Inner Classes.

Inheritance & Polymorphism: Inheritance-using super-**Method overriding (Self Study)**.

**UNIT -II PACKAGES , INTERFACE & EXCEPTION HANDLING (17 HRS.)**

Packages – Access Protection- Importing Packages-Interfaces.Exception :Exception Handling Function-Exception types-**Uncaught exception(Self Study)**-using try & catch.

**UNIT -III MULTITHREADING PROGRAMMING (17 HRS.)**

Life cycle of thread-Creating & Running Threads-Methods in thread classes.

java. lang PACKAGES: Type wrapper-The number class- the byte, short, integer and Long classes- the float and Double classes-The character class- The Boolean class- the process class- the runtime class- The system class – the object class- the math class- **the string class- string Buffer class (Self Study).**

**APPLET:** The Life cycle of Applet- The Applet class- Development and Execution of as simple Applet- Syntax of Applet tag.

#### **UNIT –IV ABSTRACT WINDOW TOOLKIT - I (17 HRS.)**

Events-Listeners-Event Handling Methods-Labels-Button Control-Checkbox Control-radio button control-Choice control-List control-Scrollbars-Flow Layout- **Border Layout(Self Study).**

**ABSTRACT WINDOW TOOLKIT - II:**Windows & frames-Menus-Dialogs-Mouse Events and their Listener-Adapter Classes- Inner classes-Anonymous Inner classes.

**SWING:** JApplet class-Icons-JLabel Control-JTextField Control-JButton Control-JCheckbox Control-JRadioButton Control-Menus-JSlider Control-JComboBoxControl-JgtabbedPane Control-JScrollPane Control-**Tables (Self Study).**

#### **UNIT –V JAVA DATABASE CONNECTIVITY (17 HRS.)**

Establishing a Connection-Creation of Data Tables-Entering Data into the tables \_ Table Updating-Use of Prepared Statement- Obtaining Metadata-Using Transaction-Scrollable Result sets-**Stored Procedure (Self Study).**

**SERVLETS:** Servlet and Dynamic Webpages- Life cycle of a servlet- A simple servlet

#### **UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 HRS.)**

Latest Trends in Java Technologies (Angular, React)

#### **TEXT BOOK:**

1. Schildt, Herbert. "Java: the complete reference." (2017).Chapters: 6, 7, 8, 9, 10, 11

- Muthu, C. "Programming with JAVA." Vijay Nicole Imprints, Chennai (2004). Chapters: 25, 8, 16, 9, 10, 11, 18, 19

### REFERENCES:

- Horstmann, Cay S., and Gary Cornell. Core Java: Advanced Features. Vol. 2. Pearson Education, 2013.
- Naughton, Patrick, and Herbert Schildt. "The complete reference java 2." (2003).
- Arnold, Ken, et al. The Java programming language. Vol. 2. Reading: Addison-wesley, 2000.

### WEB REFERNCES :

- Java Tutorial  
<https://www.tutorialspoint.com/java/>
- Java Tutorial For Beginners: Learn in 7 Days  
<https://www.guru99.com/java-tutorial.html>

### COURSE OUTCOMES

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

NO.	COURSE OUTCOMES
CO 1	Understand the concepts of Object-Oriented Programming & Java Programming Constructs.
CO 2	Understand basic concepts of Java such as operators, classes, objects, inheritance, packages, Enumeration and various keywords.
CO 3	Understand the concept of exception handling and Input/output operations.
CO 4	Design Java & Java applet based applications.
CO 5	Analyze & Design the concept of Event Handling and Abstract Window Toolkit.

**II B.Sc.  
SEMESTER -IV**

<b>PROGRAMM E CODE</b>	<b>COURS E CODE</b>	<b>COURSE TITLE</b>	<b>CATEGOR Y</b>	<b>HRS/WEE K</b>	<b>CREDIT S</b>
<b>USIT</b>	<b>19I4CC 8</b>	<b>LAB - IV- PROGRAMMIN G IN JAVA</b>	<b>Practical</b>	<b>6</b>	<b>3</b>

**COURSE DESCRIPTION**

This course gives hands on experience, practices the concepts of java programming language, and develops solutions for real world problems.

**COURSE OBJECTIVES**

To give programming skills on various concepts in JAVA.

**PROGRAM LIST**

1. Programs using Operator, Assignment Operator, Increment& Decrement Operator, Logical Operator and Bitwise Operator.
2. Programs Using IF, Conditional Operator, Array, While Loop, For Loop, Switch& Break and Continue.
3. Programs using the concept Overloading.
4. Programs using the concept Inheritance and Constructor
5. Programs using the concept Interface and Overriding .
6. Programs using the concept Built-in and User defined Exception Handling and Threads.
7. Programs using the concept Threads.
8. Programs using the concept String Handling.
9. Programs using the concept Packages

## 10. Programs for creating Applet.

**COURSE OUTCOMES**

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

<b>NO.</b>	<b>COURSE OUTCOMES</b>
CO 1	Implement Object Oriented programming concept using operators and control Structures.
CO 2	Design java programs using inheritance, interfaces and packages.
CO 3	Implement exception handling mechanism and multithreading concept.
CO 4	Design Java applet based applications.
CO 5	Design applications to Handle Events using AWT components.



**II B.Sc.  
SEMESTER – IV**

PROGRAMM E CODE	COURSE CODE	COURSE TITLE	CATEGOR Y	HRS/WEE K	CREDIT S
USIT	19I4AC 4	OPERATIN G SYSTEMS	Lecture	6	4

**COURSE DESCRIPTION**

This course content plays a vital role in making the students to understand the basic operating system concept.

**COURSE OBJECTIVES**

To introduce basic concepts and principles of operating systems, which include memory management, process management, file management.

**UNITS**

**UNIT –I OPERATING SYSTEM OVERVIEW (17 HRS.)**

Operating System Overview: Operating System Objectives and **Functions(Self Study)**, the Evolution of Operating System, Major Achievements.Processes: Process, Process states- Two state, Five State, Suspended Process.

**UNIT –II CONCURRENCY (17 HRS.)**

**Concurrency:** Principles of Concurrency, Mutual Exclusion – Hardware Support, Semaphores, Monitors, Message Passing. **Deadlock:Principles of Deadlock(Self Study)**, Deadlock Prevention, Deadlock Detection, Deadlock Avoidance.

**UNIT –III MEMORY MANAGEMENT & SCHEDULING (17 HRS.)**

**Memory Management:** Memory Management Requirements, Memory

Partitioning, Paging, Segmentation. **Uni-processor Scheduling:** Types of Processors Scheduling, Scheduling Algorithm, Scheduling Criteria, FIFO, Round Robin, Shortest Process Next, **Shortest Remaining Time (Self Study)**, Highest Response Ratio.

#### **UNIT –IV I/O MANAGEMENT AND DISK SCHEDULING (17 HRS.)**

**I/O Management and Disk Scheduling:** I/O devices, Organization of the I/O Function, I/O Buffering, Disk Scheduling. **File Management:** Overview, File Organization and Access, File Directories, **File Sharing (Self Study)**.

#### **UNIT –V LINUX FILE STRUCTURE, SHELL & FILE MANAGEMENT OPERATIONS (17 HRS.)**

**The Shell:** The Command Line, Command Line Editing, Filename Expansion: \*, ?, [ ], Standard Input/output and Redirection, Pipes |, Redirecting and Piping the Standard Error: >&, 2>. Jobs: Background, Kills, and Interruptions. **Linux Files, Directories:** The File Structure, Listing, Displaying, and Printing Files: ls, cat, more, less, and lpr, Managing Directories: mkdir, rmdir, ls, cd, and pwd, File and **Directory Operations: find, cp, mv, rm, and ln (Self Study)**.

#### **UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 HRS.)**

Recent advancements in Operating System (Ubuntu, MAC OS, Apple iOS, Android OS )

#### **TEXT BOOK:**

1. Stallings, William. Operating systems: internals and design principles. Boston: Prentice Hall, 7<sup>th</sup> edition, 2014. Chapters: 1.1-1.3, 2.1-2.2, 4.1-4.5, 5.1 - 5.4, 6.1 - 6.4, 8.1-8.2, 10.1 -10.5, 11.1 - 11.6
2. Petersen, Richard. Linux: the complete reference. McGraw-Hill Professional, 6<sup>th</sup> edition, 2000. Chapter 3, 6

#### **REFERENCES:**

1. Deitel, Harvey M., Paul J. Deitel, and David R. Choffnes. Operating systems. Pearson/Prentice Hall, 2008.

2. Madnick, Stuart E., and John J. Donovan. Operating Systems: Instructor's Manual to Accompany Operating Systems. Erg. Bd. McGraw-Hill, 2007.

**WEB REFERNCES :**

1. Operating System Tutorial - Tutorialspoint  
[https://www.tutorialspoint.com/operating\\_system/index.htm](https://www.tutorialspoint.com/operating_system/index.htm)
2. Learn Operating System (os) Tutorial - Javatpoint  
<https://www.javatpoint.com/os-tutorial>
3. Operating System Tutorial | Studytonight  
<https://www.studytonight.com/operating-system>

**COURSE OUTCOMES**

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

<b>NO.</b>	<b>COURSE OUTCOMES</b>
CO 1	Describe the evolution, types, structure and functions of operating systems.
CO 2	Explain techniques involved in concurrency and deadlock.
CO 3	Describe memory management and processor scheduling used in operating systems.
CO 4	Implement disk scheduling algorithm for a given scenario.
CO 5	Execute Linux basic commands and shell scripts.

**II B.Sc.  
SEMESTER – IV**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	19I4SB2	QUANTITATIVE APTITUDE	Lecture	2	2

**COURSE DESCRIPTION**

This course content plays a vital role for clearing any competitive exam and it covers all the Quantitative Aptitude topics and an in-depth understanding of this subject.

**COURSE OBJECTIVES**

To prepare the student with the range of skills which facilitate them to enhance their employability quotient and do well in the professional space.

**UNITS**

**UNIT –I QUANTITATIVE APTITUDE – I (6 HRS.)**

Different Number System, More on Numbers, Ratio and Proportion, Percentage, Approximate Value Calculation.

**UNIT –II QUANTITATIVE APTITUDE – II (6 HRS.)**

Mixtures, Averages, Time and Distance, Problems Based on Trains, Rowing Downstream and Upstream.

**UNIT –III QUANTITATIVE APTITUDE – III (6 HRS.)**

Pipes and Cistern, Races, Games, Time and Work, Clocks, Mensuration Area and Volume.

**UNIT –IV VERBAL REASONING- I (6 HRS.)**

SERIES: Locating Wrong Number, Probability, Data Interpretation, Data Sufficiency Series Completion, Analogy, Classification, Coding – Decoding, Blood Relations, Puzzle Test.

### UNIT –V VERBAL REASONING- II

(6 HRS.)

Direction Sense Test, Alphabetical Quibble, Number, Ranking & time, Sequence test, Mathematical Operations, Logical Sequence of Words, Arithmetical Reasoning.

#### REFERENCES:

1. Aggarwal, R. S. Quantitative Aptitude. S. Chand, 2017.

#### WEB REFERNCES :

1. Quantitative Aptitude Tutorial - Tutorialspoint  
[https://www.tutorialspoint.com/quantitative\\_apptitude/index.htm](https://www.tutorialspoint.com/quantitative_apptitude/index.htm)
2. Aptitude Tutorial - Students Tutorial  
<https://www.studentstutorial.com/apptitude/apptitude-tutorial.php/apptitude-tutorial.php>

### COURSE OUTCOMES

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

NO.	COURSE OUTCOMES
CO 1	Understand the short cut methods.
CO 2	Apply general mathematical techniques.
CO 3	Develop their critical thinking.
CO 4	Recall the formulas.
CO 5	Solve the sums by applying shortcut methods with time management.

**III B.Sc.  
SEMESTER – V**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	I5CC11	WEB TECHNOLOGY	Lecture	4	4

**Learning Outcomes:** On the successful completion of the course, students will be able to have a standard knowledge about internet and the softwares used to develop websites.

**UNIT -I: INTRODUCTION TO INTERNET [15 HRS]**

**Introduction :**Internet- History of the internet- Internet services and accessibility – uses of the internet – protocols- web concepts – the client/server model of the web-retrieving data from the web-how web works- web browsers-searching information on the web-internet standards.

**Internet protocols:** introduction-internet protocols-IP-TCP-UDP-host names-internet applications and application protocols –datagram vs stream – TFTP-FTP-TELNET-HTTP-email protocols-SMTP-POP-IMAP.

**UNIT-II : HTML, DHTML& CSS [15 HRS]**

**Introduction:** SGML- DTD-DTD elements-Attributes-Outline of an html document- Head section – prologue-link-base – meta – script – style-body section-headers-paragraphs- formatting-linking-internal linking-embedding images – lists-tables-frames-other special tags and characters-html forms.

**DHTML:**Cascading style sheets-coding CSS- DHTML Document Object Model and Collections – Event Handling – Filters and Transitions – Data

Binding

**UNIT-III: JAVASCRIPT****[15 HRS]**

Need of Script Language- **Language Elements**-Identifiers-Expressions-Java script Keywords-Operators-Statements- Functions-**Objects of Java script**- The Window Object- The Document Object- Forms Object- Text boxes and ext areas- Buttons, radio-buttons and check boxes- the select Object-**Other objects**- The Date object- The Math Object- The String Object- Regular Expressions-Arrays- Worked Examples.

**UNIT-IV: EXTENSIBLE MARK-UP LANGUAGE (XML)****[15 HRS]**

**XML Attributes:** Elements vs Attributes. **XML Validation:** Well formed, Valid XML Documents. **XML DTD:** Internal DTD, External DTD. Building Blocks of XML Documents.**DTD Elements:** Declaring Elements, Empty Elements, Elements with Data, Wrapping. **DTD Attributes:** Declaring, Default, Implied, Required, Fixed, EnumeratedAttributes. DTD Validation, XSL, XSL Transformation, XML Namespaces, XML Schema.

**UNIT -V: PERSONAL HOME PAGE (PHP)****[15 HRS]**

**Introduction:** Tags. Comments. Print and Echo statements. Variables. Data Types. Constants. Operators. **Control Statements:** if, if-else, switch-case. **Looping Constructs:** While, do-while, for loop, break and continue. String Function. Numeric Function. **Arrays:** Nested Array. User Defined Functions. Working with Forms.**MySQL:** Creating, Manipulation and Retrieving Data. **Accessing the Database with PHP:**Updating Data, Accessing through HTML Forms.

**SELF STUDY :** Control Statements in PHP

**TEXT BOOK:**

Web Technology- Second Edition - N.P. Gopalan, J. Akilandeswari- PHI Learning Private ltd. Chapters : 1,2,4,6,7,11,12

**Unit I** -Chapters 1,2    **Unit II** - Chapters 4,7    **Unit III**-Chapter 5

**Unit IV** -Chapter 8    **Unit V**- Chapter 13

**REFERENCE BOOKS:**

1. Web Programming – Building internet applications- Chris Batos.
2. Internet and Web design – Ramesh Bangia
3. Dynamic Html – Bruce Campbell, Rick Darnell

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**III B.Sc.  
SEMESTER – V**

PROGRAMM E CODE	COURS E CODE	COURSE TITLE	CATEGOR Y	HRS/WE K	CREDIT S
USIT	I5CC12	WEB TECHNOLOG Y LAB	Practicals	5	4

**Course Outcomes:** On successful completion of this experiential learning, Students will be able to develop their websites in an innovative way.

**1. HTML Programs**

1. Web page with heading, font, <HR> and marquee tags
2. Web page linking
3. Web page using <a> tag with target attributes.
4. Web page using table tag
5. Web page using forms and list tags
6. Web page with text fields, radio button and combo box.
7. Image map for given image.

**2. CSS**

1. Styling page with CSS
2. Validating page with CSS
3. Different Borders using CSS
4. Different margin using CSS
5. Font and Text using CSS
6. Positioning

**3. Java Script**

1. Displaying a popup using Javascript
2. Form validation
3. Email validation
4. Regular expression validation

**4. XML**

1. Creating CD Catalog using XML



2. Creating Plant Catalog using XML
3. Creating Food Menu using XML
4. Creating food menu styled with an XSLT style sheet
5. XML and DTD
6. XML and CSS
7. DTD and XSD

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### III B.Sc. SEMESTER – V

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	I5CC13	DATA COMMUNICATION & NETWORKING	Lecture	5	4

#### Objective:

To impart knowledge on data communication and networking and estimation of the running time.

#### UNIT-I:INTRODUCTION

[15 Hrs]

**Data communications**-components-data representation-data flow.  
**Networks**-distributed Processing-Network criteria-Physical structures-Network Models-Categories of Networks-Interconnection of Networks; Internetwork.  
**osi model:** Layered Architecture-Peer-to-peer Processes-Encapsulation. **Layers in the osi model:** Physical layer-Data Link Layer-Network Layer-transport layer-Session Layer-Presentation layer-Application Layer-Summary of layers.  
**TCP/IP Protocol Suite:** Physical and Data link layer-Network layer-transport Layer-Application Layers. **Addressing:** physical Addresses-Logical Addresses-Port Addresses-Specific Addresses.

#### UNIT-II:SWITCHING

[15 Hrs]

**Transmission Media-Guided Media**-Twisted pair cable-Coaxial Cable-Fiber-

optic cable **unguided media: wireless**-Radio waves-microwaves-Infrared.

Circuit Switched Networks-Three Phases-Efficiency-Delay-Circuit-Switched Technology in Telephone Networks-Datagram Networks-Routing Table-Efficiency- Delay-Datagram Networks in the Internet-Virtual-Circuit Networks-Addressing-Three Phases-Efficiency-Delay in Virtual-Circuit Networks- Circuit-Switched Technology in WANs.

**DATALINK CONTROL:** Framing-Fixed Size Framing-Variable-Size framing. Flow and error control- **Protocols:** Point-to-point protocol-framing-Transition Phases-Multiplexing-Multilink PPP.

### **UNIT-III: NETWORK LAYER: INTERNET PROTOCOL [15 Hrs]**

INTERNETWORKING-need for Network Layer-internet As a Datagram Network-Internet as a Connectionless Network.IPv4-Dtagram-IPv6-Advantages-Packet format-Extension Headers. Transition from IPv4 To IPv6-Dual Stack-Tunneling-Header Translation. NETWORK LAYER:DELIVERY,FORWARDING AND ROUTING-Delivery-direct versus Indirect delivery-Forwarding- Forwarding Techniques- Forwarding Process-Routing Table. Unicast Routing Protocols-Optimization-Intra-and Inter domain Routing-Distance Vector routing

### **UNIT-IV: TRANSPORT LAYER [15 Hrs]**

PROCESS-TO-PROCESS DELIVERY-client/Server paradigm-Multiplexing and Demultiplexing-Connectionless versus Connection-oriented Service-Reliable versus unreliable-Three Protocols. User Datagram Protocol-Well-Known ports of UDP-User datagram-checksum-UDP operation-Use of UDP.TCP-TCP Services-TCP features-Segment-A TCP connection-.SCTP-SCTP Services-SCTP Features-Packet format

### **UNIT-V:APPLICATION LAYER [15 Hrs]**

Name space-Flat Name Space-Hierarchical space-domain Name space-Label-domain Name-Domain-distribution of Name space-Hierarchy of name Servers-Zone-Root Server-Primary and secondary servers-DNS in the Internet-generic domains-Country Domains-Inverse domain-DNS Messages-Header. REMOTE LOGGING,ELECTRONIC MAIL,AND FILE TRANSFER-

Remote Logging-Telnet-Electronic Mail-Architecture-User Agent-Message Transfer Agent-PoP and IMAP-Web-Based Mail-File Transfer Protocol-Anonymous FTP

**SELF STUDY:** SCTP Features-Packet format-ELECTRONIC MAIL,AND FILE TRANSFER

### **TEXT BOOK**

Data Communications and Networking.Fourth Edition,Behrouz A Forouzan,The McGraw-Hill Companies.

Unit-I: Chapters: 1(page no 3-22),2(page no 27-50),3(page no 57-74),7(page no191-207)

Unit-II: Chapters: 8(page no213-232),11(page no307-311,346-355)

Unit-III: Chapters: 19(549-568),20(579-604),22(page no647-684)

Unit-IV: Chapters: 23(703-753)

Unit-V: Chapters: 25(page no797-808),26(page no817-844)

### **REFERENCES**

- Computer networks, Andrew S.Tanenbaum,Fourth edition,The Prantice hall.
- Data Communication And Networking, Dr. M.Jain, Sathish Jain, BPB Publications, Updated Edition
- Computer Network And Communication, V.K. Jain & Naveen Bajaj , Cyber Tech Publications

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**III B.Sc.  
SEMESTER – V**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	I5CC14	DATA MINING CONCEPTS	Lecture	4	4

**Course Outcomes:** On the successful completion of the course, students will be able to identify data mining tools and techniques in building intelligent machines.

**UNIT I: DATA MINING & APPLICATIONS [15 HRS]**

Data mining concepts – Database & Data Warehouse - Data Mining functionalities - Technologies used - Data Mining Applications – Major Issues in Data Mining.

**UNIT II: DATA PREPROCESSING [15 HRS]**

**Data Preprocessing:** Preprocessing the data – Data cleaning – Data Integration – Data Reduction – Data Transformation and Data Discretization.

**UNIT III: DATA MINING TECHNIQUES [15 HRS]**

**Data Mining Techniques:** Mining Frequent Patterns - Association Rule Mining – The Apriori Algorithm – FP Growth - Correlation Analysis.

**UNIT IV: CLASSIFICATION [15 HRS]**

**Classification:** Classification – Decision Tree induction - Constructing decision tree – ID3 algorithm – Pruning – Bayesian Classification – Rule

Based Classification.

**UNIT V: CLUSTERING & ADVANCED MINING CONCEPTS [15 HRS]**

**Clustering:** Cluster Analysis – Clustering Methods – Partitioning Methods – Hierarchical Methods – Density Based Methods – Outlier Analysis –  
**Introduction to Advanced Topics:** Web Mining , Text Mining, Mining Multimedia Data and Mining data Streams.

**SELF-STUDY:** Hierarchical Clustering

**TEXT BOOK:**

1. Data Mining Concepts and Techniques - 3<sup>rd</sup> Edition. Authors: Jiawei Han, Micheline Kamper, Morgan Kaufmann Publisher. Reprinted in 2016.
  - Unit-I** : Chapters: 1, Chapter 13.3
  - Unit-II** : Chapters: 3
  - Unit-III** : Chapters: 6 (*page no 243-259*), (*page no 264-267*)
  - Unit-IV** : Chapters: 8.1-8.4
  - Unit-V** : Chapters: 10.1 – 10.4.12.1, 13.1.3

**REFERENCE BOOKS:**

- 1) ArunK.Pujari, “Data Mining Techniques”, 3<sup>rd</sup> edition , Universities Press, 2015.
- 2) Pieter Adriaans, Dolf Zantinge “Data Mining”, Pearson Education
- 3) K.P.Soman, Shyam Diwakar, V.Ajay, “Insight into Data Mining – Theory and Practice”, Prentice Hall of India, 2009.
- 4) [https://www.tutorialspoint.com/data\\_mining/index.htm](https://www.tutorialspoint.com/data_mining/index.htm)

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**III B.Sc.  
SEMESTER – V**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	I5CC15	SOFTWARE ENGINEERING	Lecture	4	4

**Course Outcomes:** On the successful completion of the course, students will be able to explain a process model for a software project Development. Prepare the SRS, Design document, Project plan of a given software system. Apply Project Management and Requirement analysis

**UNIT I: SOFTWARE ENGINEERING & PLANNING [15 HRS]**

Size factors – Quality and Productivity Factors – Managerial Issues. **Planning a Software Project:** Problem definition – Developing a Solution Strategy – Planning the Development Process – Planning an Organizational Structure – Other Planning Activities.

**UNIT II: SOFTWARE COST ESTIMATION [15 HRS]**

**Software Cost Estimation:** Software Cost Factors – Software Cost Estimation Techniques – Staffing-Level Estimation – Estimating Software Maintenance Costs.

**UNIT III: SOFTWARE REQUIREMENTS [15 HRS]**

The Software Requirements Specification – Formal Specification Techniques – Languages and Processors for Requirements Specification.

**UNIT IV: SOFTWARE DESIGN& IMPLEMENTATION [15 HRS]**

**Software Design:** Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real-Time and Distributed System Design – Test Plans – Milestones, Walkthroughs, and Inspections – Design Guidelines. **Structured Coding Techniques:** Single Entry, Single Exit constructs – Coding Style – Documentation Guidelines.

**UNIT V: VERIFICATION, VALIDATION & MAINTENANCE [15 HRS]**

**Verification and Validation Techniques:** Quality Assurance – Static Analysis – Symbolic Execution – Unit Testing and Debugging – System Testing – Formal Verification.

**Software Maintenance:** Enhancing Maintainability During Development – Managerial Aspects of Software Maintenance – Configuration Management – Source-Code Metrics – Other Maintenance Tools and Techniques.

**SELF-STUDY:** Maintenance Tools and Techniques

**TEXT BOOK:**

1) SOFTWARE ENGINEERING CONCEPTS – RICHARD FAIRLEY – Tata McGraw - Hill Publishing Company Limited, New Delhi 1997.

**Unit – I** : Chapters 1, 2 **Unit – II** : 3 **Unit – III** : 4

**Unit – IV** : 5,6 **Unit – V** : 8.1 – 8.7, 9.1 - 9.5

**REFERENCE BOOKS:**

1. Roger Pressman, Software Engineering: A Practitioners Approach, (8th Edition), McGraw Hill, 2015
2. SOFTWARE ENGINEERING – K. L. JAMES, Prentice Hall of India Pvt. Ltd. , New Delhi – 2009
3. FUNDAMENTALS OF SOFTWARE ENGINEERING – RAJIB MALL, Prentice Hall of India Pvt. Ltd. , New Delhi – 2003
4. <https://www.coursera.org/learn/software-processes>

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**III B.Sc.**  
**SEMESTER – V**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	I5ME1	INFORMATION STORAGE AND MANAGEMENT	Lecture	4	4

**Objective:** To know the Key challenges in Managing Information and Storage Network Technologies.

**UNIT I: STORAGE SYSYEM** **[15 HRS]**

**Introduction to Information Storage and Management:** Information storage – Evolution of Storage Technology Architecture – Data Center Infrastructure – Key Challenges in Managing Information – Information Lifecycle. **Storage System Environment:** Components of a Storage System Environment

**UNIT II: DATA PROTECTION** **[15 HRS]**

RAID : Implementation of RAID – RAID Array Components - RAID Levels. Intelligent Storage System: Components of an Intelligent Storage System – Intelligent Storage Array – High end Storage System – Mid Range Storage System

**UNIT III: STORAGE NETWORKING TECHNOLOGIES & AREA** **[15 HRS]**

Direct –Attached Storage: Types of DAS – DAS Benefits & Limitations – Fibre Channel: Overview - The SAN and Its Evolution – Components of SAN – Network Attached Storage: General Purpose Servers Vs NAS Devices – Benefits of NAS – NAS File I/O – Components of NAS.

**UNIT IV: BACKUP & RECOVERY** **[15 HRS]**

Backup Purpose – Backup Considerations – Backup Granularity - Recovery Considerations – Backup Methods – Backup Process – Backup and Restore

Operations – Backup Topologies

**UNIT V: STORAGE SECURITY & MANAGEMENT [15 HRS]**

**Securing the Storage Infrastructure:** Storage Security Framework - Risk Triad- Storage Security Domains- **Managing the Storage infrastructure:** Monitoring the Storage Infrastructure.

**Self Study:** Backup technologies – Monitoring the storage infrastructure

**TEXT BOOK:**

Information Storage and Management – G.Somasundaram, Alok Shrivastava, EMC Education Services, Wiley Publishing

Chapters : 1,2.1, 3.1-3.3, 4.1,4.2, 5.1,5.2,6.1-6.3,7.1-7.4, 12.1-12.8, 15.1,15.2,16.1

**REFERENCE BOOKS:**

1. Robert Spalding, “Storage Networks ” The Complete Reference, Tata McGraw Hill, 2003
2. Marc Fairley, “Building Storage Networks”, Tata McGraw Hill, 2001
3. E-Source: [www.emc.com/resource\\_library/resource-library.esp](http://www.emc.com/resource_library/resource-library.esp)

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**III B.Sc.  
SEMESTER – V**

PROGRAMM E CODE	COURS E CODE	COURSE TITLE	CATEGOR Y	HRS/WE K	CREDIT S
USIT	I5ME2	MULTIMEDIA TECHNOLOGIE S	Lecture	4	4

**Objectives :** To make the students know the trendy Multimedia technologies

**UNIT -I: INTRODUCTION TO MULTIMEDIA [15 Hrs]**

Multimedia introduction-multimedia market-Content and copyrights-Resources for multimedia developers. **Products and Evaluation:** Types of products-Evaluation.

**UNIT-II: HARDWARE, OPERATING SYSTEMS AND SOFTWARE: [15 Hrs]**

Computer Architecture-Computer Architecture standards-Operating systems and software-Multimedia computer Architecture-Software executables and Libraries-Software drivers.

**Text:** Elements of text-Text data files-Using text in multimedia Applications-Hypertext.

**UNIT-III: GRAPHICS: [15 Hrs]**

Elements of graphics-Images and color-Graphics file and application formats-Obtaining images for multimedia use-Using graphics in multimedia applications. **Digital audio:** Characteristics of sound and digital audio-Digital audio systems-MIDI-Audio file formats-Using audio in Multimedia applications-Using audio to enhance other contents-Audio for content delivery.

**UNIT-IV: DIGITAL VIDEO AND ANIMATION: [15 Hrs]**

Background on video-Characteristics of Digital video-Digital video data sizing-Video capture and playback systems-Computer animations-Using digital video in multimedia applications.

**UNIT-V: MULTIMEDIA AND THE INTERNET: [15 Hrs]**

The internet-HTML and web authoring-Multimedia considerations for the Internet-Design considerations for the Web pages.

**Self Study :** MIDI- Design considerations for the web pages.

**TEXT BOOK:**

Multimedia Technology and Applications by David Hillman, Galgotia Publication Pvt Ltd.

**Chapters:**

Unit I: Chapter 1,2

Unit II: Chapter 3,4

Unit III: Chapter 5,6

Unit IV: Chapter 7

Unit V: Chapter 10

**REFERENCE BOOK:**

1. Principles of Multimedia - Ranjan Parekh - TMGH, New Delhi - Twelfth Reprint,
2. Fundamental of Multimedia - Ze-Nian Li & M. S. Drew

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**III B.Sc.**  
**SEMESTER – V**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	I5SB3	IMAGE DESIGNING SOFTWARE	Practical	2	2

**OBJECTIVES :**

To introduce the concept of Vector based Drawing

**UNIT -I: BASICS OF CORELDRAW [6 Hrs]**

Introduction-Getting Started-Creating A New File - Title Bar-Menu Bar- Tool Bar - Work Area-Views.

**UNIT -II: WORKING WITH LINES & OBJECTS [6 Hrs]**

Lines-Straight Lines-Continuing a Line-View Mode- Selecting Objects-Rotating An Object-Fill -Positioning.

**UNIT -III: TEXT [6 Hrs]**

Introduction-Text Tool-Converting Text-Formatting Text-Changing the Font Size-Decorating the Text-Webdings-Changing the Alignment-Applying Effects

**UNIT -IV: IMAGE [6 Hrs]**

Bitmap Images-Vector Image-Resizing-Rotating-Skewing-Moving-Cropping-Importing Images-Adding Special Effects-Converting to Bitmap-Exporting Images.

**UNIT -V: PAGE LAYOUT [6 Hrs]**

Changing the Page Size-Changing the Layout-Applying Styles-Applying Bitmaps to the Background – Changing the Background-Adding a Page Frame-Moving Between Pages.

**TEXT BOOKS :**

CorelDRAW X4, Author: Kogent Solutions Inc.

**WEB REFERENCE:**

Spoken Tutorial – Inkscape

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### III B.Sc. SEMESTER – V

PROGRAMM E CODE	COURS E CODE	COURSE TITLE	CATEGOR Y	HRS/WE K	CREDIT S
USIT	I5SB4	WEB DESIGN USING DREAMWEAVE R	Practical	2	2

**Course Outcomes:** This experiential learning will let the students to create a trendy commercial websites.

#### UNIT – I [6 HRS]

Customizing the workspace – Switching and Splitting Views – Working with Panels – Selecting a workspace Layout - Adjusting toolbars – HTML in Dreamweaver – CSS in Dreamweaver

#### UNIT – II [6 HRS]

Defining a Site – Saving a Page – Inserting Text – Adjusting Fonts, colors and Sizes – Previewing a Page

#### UNIT – III [6 HRS]

Adding Background image to the header - Inserting <div> components – Inserting Image Placeholder – Modifying Footer, Working with Cascading Style Sheets.

#### UNIT-IV [6 HRS]

Working with Templates - Working with Text, Lists, and Tables – Working with Images - Working with Navigation.

#### UNIT-V [6 HRS]

Working with Forms - Specifying a form action - Emailing form data - Styling forms - Adding Interactivity - Previewing a completed file

#### TEXT BOOK:

“First Lessons in Dreamweaver CS6 ” - by LP Editorial Board. Lawpoint Publications

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### III B.Sc. SEMESTER – VI

PROGRAMM E CODE	COURS E CODE	COURSE TITLE	CATEGOR Y	HRS/WEE K	CREDIT S
USIT	I6CC16	.NET PROGRAMMIN G	Lecture	5	4

**OBJECTIVE:** To impart the knowledge of .NET Programming.

#### UNIT I: INTRODUCTION TO .NET

[15HRS]

.Net framework overview - Common type system - Common intermediate language - Namespace - Languages in .Net - C# - Encapsulation - Polymorphism - Interfaces -XML - ADO.NET. **OurFirst VB.Net Program:** The solution explorer window - Class view window -Toolbox - Output Window- Task list Window. **DataTypes and Operators:** Literals - Variables - Data types - Declaration of Variables - Constants - Statements - Operators - Keywords -Comments - Scope of Variables - Console application in VB.Net.

#### UNIT II: CONTROL STATEMENTS

[15HRS]

If Statement - Looping - Select Case- Go To statement- Intrinsic Control list-form control- Events- label- Textbox- Group box- check box- radio button- Scroll bar- Ctype- Track bar- Timer- Picture box- Working with mouse input- Link Label- Date time Picker- Month Calendar. **Arrays:** One dimensional Array- Array Initialization- Redim Statement- Multi dimensional Array- Array of array- List box control- Checked list box control- Combo Box control.

#### UNIT III: PROCEDURES & STRUCTURES

[15HRS]

Subroutine procedures- Functions- Value returned by its function name- the return statement- Calling a function- Call by reference- Functions with arrays- Functions with Param arrays- Function Overloading- Sub Procedure-

Structure- Functions inside the Structure- Nested Structures- Message box functions- Input box function.**Creating Menus and using Dialog boxes:** Menu- MDI form- Context Menu- Rich Text box- Color Dialog control- Font Dialog control.

**UNIT IV: DATA ACCESS WITH ADO.NET****[15 HRS]**

What is database? - What is Relational database- Table Creation- Record insertion- Displaying data- Deleting Data- Modifying Data- Drop Table- Special Features of ADO.NET- Difference between ADO & ADO.NET- Connections- Commands- Data Reader- Data Set- Using Data Grid- Using Data Adapter configuration wizard- XML &ADO.NET- XML document to ADO.NET data- Filtering data using Data View- Complex data binding- Command parameters property- Using stored procedures with a command.

**UNIT V:WEB APPLICATION WITH VB.NET & ASP.NET****[15HRS]**

Our first web application- Server controls- Validation Summary Control- ADO.NET& Data Binding. **Advanced Controls and Making Reports in VB.NET:** Tab Control- Toolbar Control- Error Provider Control- Tree View Control- Creating a user control in VB.NET- Adding a user control in VB.NET- Making Reports in VB.NET.

**SELF-STUDY:**Creating Menus and using Dialog boxes

**TEXT BOOKS :**

1) VB.NET by P.Radhaganesan, Scitech Publications, Chennai.

Unit I: Chapters 1, 2, 3

Unit II: Chapters 4, 5

Unit III: Chapters 6, 7

Unit IV: Chapter 10

Unit V: Chapter 11, 13

**REFERENCE BOOK:**

1. Visual Basic .Net Programming Black Book by STEVEN HOLZNER, Dreamtech Press



2. Visual Basic 6 from the Ground Up by *Gary Cornell, Osborne Mcgraw Hill.*
3. Greg Buczek, “ASP .NET Developer’s Guide”, Tata McGraw – Hill.
4. Programming VB .NET: A Guide for Experienced Programmers Gary Cornell and Jonathan Morrison

**WEB REFERNCES :**

1. Asp and Asp.net Tutorials

<https://www.w3schools.com/asp/default.ASP>

2. Asp.net Tutorial

<https://www.tutorialspoint.com/asp.net/index.htm>

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**III B.Sc.  
SEMESTER – VI**

<b>PROGRAMM E CODE</b>	<b>COURS E CODE</b>	<b>COURSE TITLE</b>	<b>CATEGOR Y</b>	<b>HRS/WEE K</b>	<b>CREDIT S</b>
<b>USIT</b>	<b>I6CC17</b>	<b>LAB – V- .NET PROGRAMMIN G</b>	<b>Practical</b>	<b>4</b>	<b>4</b>

**OBJECTIVES**

To facilitate the students to understand the dot net framework environment and programming concepts in dot net framework.

**PROGRAM LIST**

**VB.NET PROGRAMMING**

1. Accept a character from console and check the case of the character.
2. Write a program to accept any character from keyboard and display whether it is vowel or not.
3. Write a VB.Net program to accept a string and convert the case of the characters.
4. Develop a menu based VB.Net application to implement a text editor with cut, copy, paste, save and close operations.
5. Write a program to implement a calculator with memory and recall operations.
6. Develop a form in VB.NET to pick a date from Calendar control and display the day, month, and year details in separate text boxes.
7. Develop a VB.Net application to perform timer based quiz of 10 questions.
8. Develop a VB.Net application using the File and Directory controls to implement a common dialog box.
9. Develop a database application to store the details of students using ADO.NET

10. Develop a database application using ADO.NET to insert, modify, update and delete operations.
11. Develop a VB.Net application using Datagrid to display records.
12. Develop a VB.Net application using Datagrid to add, edit and modify records.

### **ASP.NET and XML PROGRAMMING**

1. Create a simple ASP.NET page to Output Text with a form, two HTML text boxes, an HTML button, and an HTML <span> element. Create an event procedure for the button.
2. Create a web application in ASP.NET using three different controls to the ASP.NET page for reserving rooms in hotel. The three controls are a button control, a label control, and a drop-down list control.
3. Create a application for Accessing a SQL Database by Using ADO.NET by connecting to the SQL Server database and call a stored procedure. You then display the data in a Repeater control.
4. Develop a web application to read the details of the selected country stored in XML database and display back to the user using Web controls
5. Develop a web application to read an XML document containing subject, mark scored, year of passing into a Dataset

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**III B.Sc.  
SEMESTER – VI**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	I6CC18	INFORMATION SECURITY	Lecture	5	4

**OBJECTIVE:**

To provide a framework of knowledge related to mechanisms that makes Information secured over communication channels.

**UNIT-I : INTRODUCTION****[15 Hrs]**

Computer security concepts – The OSI security Architecture - Security Attacks – Security Services – Security Mechanisms – A Model For Internetwork Security.

**Symmetric Encryption & Message Confidentiality** : Symmetric Encryption Principles – Conventional Encryption Algorithms

**UNIT II : CRYPTOGRAPHY****[15Hrs]**

Public Key Cryptography and Message Authentication: Approaches to Message Authentication – Secure Hash Function – Public Key Cryptography Principles – Digital Signatures

**UNIT III : WIRELESS NETWORK SECURITY****[15Hrs]**

IEEE 802.11 Wireless LAN overview – IEEE 802.11i Wireless LAN security – Wireless Application Protocol overview- WAP end-to-end Security

**UNIT-IV : IP SECURITY****[15Hrs]**

IP security overview – IP security policy – Encapsulating Security Payload – Combining Security Association.

**UNIT-V: FIREWALLS****[15Hrs]**

The Need for Firewalls - Firewall Characteristics – Types of Firewalls –  
Firewall basing - Firewall location and Configurations

**Self Study :** Types of Firewall

**TEXT BOOK :**

Network Security Essentials – Applications and Standards - William  
Stallings 4<sup>th</sup> Edition

Chapters : 1, 2, 3, 6, 8,11 Unit I – Chapters 1, 2 Unit II- Chapter 3

Unit III – Chapters 6 Unit IV- Chapter 8 Unit V- Chapters 11

**REFERENCE BOOKS :**

- 1) Cryptography and Network Security – Principles and Practices  
2<sup>nd</sup> Edition - William Stallings
- 2) Internet Cryptography - Richard E. Simth

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**III B.Sc.  
SEMESTER – VI**

PROGRAMM E CODE	COURS E CODE	COURSE TITLE	CATEGOR Y	HRS/WEE K	CREDIT S
USIT	I6ME3	CLOUD COMPUTIN G	Lecture	5	4

**OBJECTIVES:** On Successful completion of this course, the students are able to acquire the knowledge about the Computations done in cloud , its architecture and to build their own cloud.

**UNIT-I: UNDERSTANDING CLOUD COMPUTING: [15HRS]**

Origin and Influence- Basic concepts and terminology-goals and benefits-Risks and challenges. **FUNDAMENTAL CONCEPTS AND MODELS:** Roles and Boundaries-Cloud Characteristics-Cloud Delivery Models.

**UNIT-II: CLOUD ENABLING TECHNOLOGY [15 HRS]**

Broad band Network and Internet Architecture-Data center Technology-Virtualization Technology-Web Technology-Multitenant Technology-Service Technology.

**UNIT-III: FUNDAMENTAL CLOUD SECURITY [15 HRS]**

Basic terms and Concepts-Threat Agents-Cloud Security Threats.

**Cloud Infrastructure Mechanism:** Virtual server-cloud storage devices-cloud usage monitor-Resource replication-readymade Environment.

**UNIT IV: SPECIALIZED CLOUD MECHANISMS [15 HRS]**

Automated Scaling Listener-Load balancer-SLA monitor-Pay-per-use monitor-Audit monitor. Fail over system-Hypervisor-Resource cluster-Multi Device Broker-state management database. **Cloud security mechanism:**

Encryption-Hashing-Digital signature-Public key Infrastructure.

**UNIT V : CLOUD COMPUTING ARCHITECTURE: [15 HRS]**

Identity and access management-single sign on-Cloud Based security groups-Hardened Virtual Server Images. **Fundamental cloud architecture:**

Workload Distribution Architecture-Resource Pooling Architecture-Cloud Bursting Architecture-Redundant Storage Architecture.

**SELF STUDY:** Virtual server-cloud storage devices.

**TEXT BOOK:**

**“CLOUD COMPUTING CONCEPTS, TECHNOLOGY AND ARCHITECTURE”**-Thomas Erl with Zaigham Mahmood and Richard Pultini. Pearson India Education Services Pvt .ltd

**Chapters:**

UNIT –I CHAPTER 3.1-3.4,4.1-4.4.

UNIT – II CHAPTER 5.1-5.6.

UNIT –III CHAPTER 6.1-6.3,7.2-7.6.

UNIT- IV CHAPTER 8.1-8.10,10.1-10.4.

UNIT- V CHAPTER 10.5-10.8,11.1,11.2,11.6,11.8.

**REFERENCE BOOK:**

1.“Cloud Computing Principles and Paradigms”- Rajkumar Buyya, James Broberg, Andrzej Goscinski. Wiley India Pvt ., Ltd.,

2.“Cloud Computing Explained: Implementation Handbook for Enterprises”,- John Rhoton,Amazon.com.

3.“Cloud Computing and SOA Convergence in Your Enterprise: A Step-by-Step Guide”- David S. Linthicum.

**WEB REFERENCE :**

1. <https://www.guru99.com/cloud-computing-for-beginners.html>

2. [https://www.tutorialspoint.com/cloud\\_computing](https://www.tutorialspoint.com/cloud_computing)

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**III B.Sc.**  
**SEMESTER – VI**

PROGRAMM E CODE	COURS E CODE	COURSE TITLE	CATEGOR Y	HRS/WEE K	CREDIT S
USIT	I6ME4	MOBILE COMPUTIN G	Lecture	5	4

**OBJECTIVES:** Through this course, the students are able to acquire the knowledge about the technologies in mobile computing and its security issues. Students are made aware of the advantage and disadvantages of the mobile applications, which becomes an important gadget of our day- to-day life.

**UNIT I: INTRODUCTION: [15 HRS]**

Mobile Computing – Dialogue Control – Networks – Middleware & Gateways -

**MOBILE COMPUTING ARCHITECTURE:** History of computers and Internet – Architecture for mobile computing – Three-tier architecture

**UNIT II: MOBILE COMPUTING THROUGH TELEPHONY: [15 HRS]**

Evaluation of telephony – Multiple access procedures – Satellite Communication Systems. – **EMERGING TECHNOLOGIES:** Introduction – Blue Tooth – RFID – WiMAX – Mobile IP

**UNIT III: GSM : [15 HRS]**

Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – **SMS:** Mobile Computing over SMS – Short Message Service – Value Added Service through SMS.

**UNIT IV: GPRS: [15 HRS]**

GPRS and packet data network – GPRS network architecture – GPRS



network operations – Data services in GPRS – Application for GPRS-Limitations

**UNIT V: CDMA and 3G:****[15 HRS]**

Spread spectrum technology – CDMA vs. GSM – Wireless Data – Third generation networks – Applications on 3G. **SECURITY ISSUES IN MOBILE COMPUTING:** Information Security – Security Techniques & Algorithms.

**SELF STUDY:** Short Message Service, Security Techniques & Algorithms.

**TEXT BOOK: MOBILE COMPUTING,** Asoke K Talukder , Hasan Ahmed, Roopa R Yavagal, Second Edition, TMH, 2005 B.Sc. CS/IT/CT/SS/MM/CSA &BCA 2016-17onwards Annexure No: 25A, Tata Mcgraw Hill Education(India) Private Limited.

**Unit I:** Chapter **1** - 1.3, 1.4, 1.5, 1.6

Chapter **2** – 2.1, 2.2, 2.4, 2.5

**Unit II:** Chapter **3:** 3.1, 3.2, 3.3

Chapter **4:** 4.1, 4.2, 4.3, 4.4, 4.5

**Unit III:** Chapter **5:** 5.1, 5.2, 5.3, 5.4, 5.5, 5.7

Chapter **6:** 6.1, 6.2, 6.3

**Unit IV:** Chapter **7:** 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7

**Unit V:** Chapter **9:** 9.1, 9.2, 9.4, 9.5 9.6, 9.7

Chapter **20:** 20.1, 20.2, 20.3

**REFERENCES:**

- Mobile Communication 2nd edition by Jochen Schiller, Pearson education
- “Principles of Mobile Communication” by B Stuber Gordon L
- Jochen H. Schiller, “Mobile Communications”, Second Edition, Pearson Education, New Delhi, 2007
- Dharma Prakash Agarwal, Qing and An Zeng, "Introduction to Wireless and Mobile systems", Thomson Asia Pvt Ltd, 2005.

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**III B.Sc.  
SEMESTER – VI**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	I6ME5	COMPUTER GRAPHICS	Lecture	5	4

**OBJECTIVES:** At the end of the course, the student are able to apply two dimensional transformations and apply clipping techniques to graphics. They will also be write their algorithm to design graphical images.

**UNIT I: A SURVEY ON COMPUTER GRAPHICS [15 HRS]**

A survey of computer graphics: Computer-Aided Design - Presentation Graphics - Computer Art - Entertainment - Education and Training - Visualization - Image Processing - Graphical User Interfaces Overview of Graphics Systems: Video Display Devices - Raster Scan Systems - Random Scan Systems - Input Devices - Hard Copy Devices.

**UNIT II: OUTPUT PRIMITIVES [15 HRS]**

Output Primitives: Points and Lines - Line Drawing Algorithms - Circle Generating Algorithms - Filled Area primitives

**UNIT III: ATTRIBUTES OF OUTPUT PRIMI [15 HRS]**

Line Attributes - Curve Attributes - Color and Gray Scale Levels - Area Fill Attributes - Character Attributes - Bundled Attributes- Antialiasing

**UNIT IV: TWO -DIMENSIONAL GEOMETRIC TRANSFORMATIONS**

**[15 HRS]**

Basic Transformations - Matrix Representations - Composite Transformations - Other Transformations - Transformations Between Coordinate Systems

**UNIT V:TWO –DIMENSIONAL VIEWING****[15 HRS]**

The Viewing Pipeline – Viewing Coordinate Reference Frame – Window –to-Viewport Coordinate Transformation – Two-Dimensional Viewing Functions – Clipping Operations – Point Clipping – Line Clipping – Polygon Clipping – Curve Clipping – Text Clipping – Exterior Clipping.

**TEXT BOOK:**

1. Donald Hearn and Pauline Baker M., Computer Graphics, C Version, Pearson Education, Second Edition Indian Reprint , New Delhi, 2012.

**Chapters**

Unit – I : 1.1 – 1.8, 2.1-2.3, 2.5, 2.6

Unit – II : 3.1, 3.2, 3.5, 3.11

Unit – III : 4.1 – 4.8

Unit – IV : 5.1 – 5.5

Unit – V : 6.1 – 6.11

**REFERENCE BOOKS:**

1. John F. Hughes, Andries Van Dam, Morgan Mc Guire ,David F. Sklar , James D. Foley, Steven K. Feiner and Kurt Akeley ,”Computer Graphics: Principles and Practice”, , 3 rd Edition, Addison-Wesley Professional,2013. (UNIT I, II, III, IV).
2. Jeffrey McConnell, “Computer Graphics: Theory into Practice”, Jones and Bartlett Publishers, 2006.
3. Hill F S Jr., "Computer Graphics", Maxwell Macmillan” , 1990.
4. William M. Newman and Robert F.Sproull, “Principles of Interactive Computer Graphics”, Mc Graw Hill 1978.
5. <http://nptel.ac.in/>

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**III B.Sc.  
SEMESTER – VI**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	I6ME6	INTERNET & E- COMMERCE	Lecture	5	4

**OBJECTIVE:**

To impart the knowledge about both internet and e-commerce.

**UNIT-I: INTERNET CONNECTION CONCEPTS [15 Hrs]**

Internet-computers on the internet-servers, clients and ports-The domain name system and DNS servers-Internet services-types of Accounts-Telephone, cable and satellite connections-Choosing an ISP-TCP/IP and connection software

**E-mail concepts**

Getting of E-Mail-E-mail addressing-Downloading E-mail-E0-mail Netiquette-Using smileys, Emotions and abbreviations-Formatted E-mail-signature and stationery-E-mail attachments-Web based email-Mail away from home-Common E-mail error messages.

**Basic E-mail commands :** Netscape messenger-Pine

**UNIT- II: ONLINE CHATTING AND CONFERENCING CONCEPTS**

**[15 Hrs]**

Online chatting and conferencing concepts-Forms of chat and Conferencing-chat working. **Other types of chat** - Web-based chat-direct chat systems-MUDs, MOOs, and MUSHes. **Voice and Video Conferencing**

Voice and Video Conferencing-Define Voice and Video Conferencing-gathering your equipment- Conferencing is more than talking and seeing-Conferencing using NetMeeting-Getting together using Conference-voice Conferencing and video Conferencing with CU-See Me-summary of Conferencing applications

**UNIT-III: INTRODUCTION TO E-COMMERCE [15 Hrs]**

Welcome to Electronic Commerce: Electronic commerce Framework – Electronic Commerce and Media Convergence – The Anatomy of E-commerce- Electronic Commerce Consumer Applications

**Electronic Commerce and World Wide Web:** Architectural Framework for Electronic Commerce – World Wide Web as the Architecture – Web Background: Hypertext Publishing – Technology behind the web.

**UNIT-IV: ELECTRONIC PAYMENT SYSTEMS : [15 Hrs]**

Types of Electronic Payment Systems – Digital Token-Based Electronic Payment Systems – Smart Cards and Electronic Payment Systems – Credit Card-Based Electronic Payment Systems – Risk and Electronic Payment Systems – Designing Electronic Payment Systems

**UNIT-V: INTER ORGANIZATIONAL COMMERCE AND EDI: [15 Hrs]**

Electronic Data Interchange – EDI Applications in Business – EDI: Legal, Security, and Privacy Issues – EDI and Electronic Commerce

**Self Study:** Designing Electronic Payment Systems - EDI and Electronic Commerce

**TEXT BOOKS**

1. Internet Millennium Edition-The complete Reference-Margaret Levine Young
2. Frontiers of Electronic Commerce – Ravi Kalkota – Andrew B. Whinston -1996 Pearson Education, Inc.

**UNIT I:** Chapters 1, 5 from Book1

**UNIT II:** Chapters 11, 16, 17 from Book1

**UNIT III :** Chapters 1.1- 1.4, 6.1 – 6.4 from Book2

**UNIT IV :** Chapters 8.1-8.6 from Book2

**UNIT V:** Chapters 9.1 – 9.4 from Book2

**REFERENCE BOOKS:**

1. Electronic Commerce – Kamelesh K.Bajaj, Debjani Nag - McGraw Publication, Second Edition
2. Introduction to E-Commerce – Jeffrey F.RayPort, Bernard. J. Jaworski – Tata McGraw Publication, Second Edition
3. Internet and Web technology – RajaKamal - Tata McGraw Publication.

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**III B.Sc.  
SEMESTER – VI**

PROGRAMM E CODE	COURS E CODE	COURSE TITLE	CATEGOR Y	HRS/WEE K	CREDIT S
USIT	I6SB5	3D ANIMATIO N SOFTWARE	Practical	2	2

**OBJECTIVES :**

To introduce the concept of 3D animation software

**UNIT -I: EXPLORING THE INTERFACE: [6 Hrs]**

Introduction to Alice - download and install Alice 3.1-A brief tour of the Alice 3 IDE -A brief tour of the Menu Bar- Set Preferences -Touring the Gallery

**UNIT-II: SETTING THE SCENE [6 Hrs]**

Adding an object to a scene- set object properties in the Scene editor- set special effects in a scene-Marking - position and resize an object in the Scene editor- Positioning sub-parts in Scene editor- align objects using a Snap grid- Cut, Copy, and Paste with the Clipboard

**UNIT -III: LEARNING TO PROGRAM THROUGH ALICE [6 Hrs]**

Sequential & Parallel Execution - Do in order - Do together- Further nesting- Branching & Looping-Conditional execution-Relational Operators-Randomness-Repetition-While loops- Lists

**UNIT-IV: EVENT HANDLING AND METHODS: [6 Hrs]**

Interactive programming & event handling - Control of flow- Events- Event handing methods.

**UNIT-V: 3D TEXT AND BILLBOARDS, SOUND: [6 Hrs]**

Create 3D Text- Billboards- Creating a Sound- Adding a Sound - Posting on YouTube

**TEXT BOOKS :**

“Introduction to Programming with Green foot “, by Micheal Kolling

**WEBSITE :**

[http://www.alice.org/3.1/materials\\_videos.php](http://www.alice.org/3.1/materials_videos.php)

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**III B.Sc.  
SEMESTER – VI**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	I6SB6	IMAGE EDITING SOFTWARE	Practical	2	2

**OBJECTIVES**

To introduce the editing techniques in Photoshop 7.0

**UNIT-I - INTRODUCTION TO ADOBE PHOTOSHOP [6 Hrs]**

About Photoshop - Navigating Photoshop - Menus and panels -Opening new files - Opening existing files

**UNIT-II : GETTING STARTED WITH PHOTOSHOP [6 Hrs]**

Exploring the Toolbox - The New CS4 Applications Bar & the Options Bar - Exploring Panels & Menus - Creating & Viewing a New Document - Customizing the Interface - Setting Preferences

**UNIT-III : FILTERS [6 Hrs]**

Sharpen Filters: Sharpen, Sharpen more, Blur Filters: Blur, Blur-more, Distort Filters: Pinch(Squeezing, bulging)- Pixellate Filters: crystallize, Extracting an part of image from background image.

**UNIT-IV:GETTING STARTED WITH LAYERS [6Hrs]**

Understanding the Background Layer- Creating, Selecting, Linking & Deleting Layers- Locking & Merging Layers- Copying Layers, Using Perspective & Layer Styles- Filling & Grouping Layers- Introduction to Blending Modes- Blending Modes, Opacity & Fill- Creating & Modifying Text

**UNIT -V: PHOTO RETOUCHING [6 Hrs]**

The Red Eye Tool- The Clone Stamp Tool- The Patch Tool & the Healing Brush Tool - The Spot Healing Brush Tool- The Color Replacement Tool- The

Toning & Focus Tools -Painting with History

**TEXT BOOKS**

- Photoshop 6 Complete reference - Greenberg – McGraw Hill Publications.
- Page Maker Complete reference - Greenberg– McGraw Hill Publications

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