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(*An Autonomous Institution – Affiliated to Madurai Kamaraj University*)

Re-accredited (**3rd Cycle**) with Grade **A+** & **CGPA 3.51** by NAAC

DEPARTMENT OF INFORMATION TECHNOLOGY

CBCS SYLLABUS

BACHELOR OF SCIENCE

PROGRAMME CODE - I

COURSE STRUCTURE

(w.e.f. 2021 – 2022 Batch onwards)

Annexure - 8

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DEPARTMENT OF INFORMATION TECHNOLOGY – UG

(w.e.f. 2021– 2022 Batch onwards)

COURSE STRUCTURE - SEMESTER WISE

Sem.	Part	Sub. Code	Title of the paper	Teaching hrs. (per week)	Exam Duration of (hrs)	Maximum Marks			Credits
						CIA	SE	Total	
V	III	**21I51**	**Core 9**: Programming in Java	5	3	25	75	100	4
	III	**21I52**	**Core 10**: Computer Graphics	5	3	25	75	100	4
	III	**21I53**	**Core 11**: Computer Networks	5	3	25	75	100	4
	III	**21I5P**	**Core Lab 12**: Programming in Java Lab	6	3	40	60	100	4
	III		**Elective - I**	5	3	25	75	100	5
	IV	**21SEI5P**	**SBE:** Multimedia Lab	2	3	40	60	100	2
	IV	**214EV5**	Environmental Studies	2	3	25	75	100	2
VI	III	**21I61**	**Core 13:** Software Engineering	5	3	25	75	100	4
	III	**21I62**	**Core 14**: Data Mining and Warehousing	5	3	25	75	100	4
	III	**21I6P**	**Core Lab 15**: Web Technology Lab	6	3	40	60	100	4
	III		**Elective - II**	5	3	25	75	100	5
	III	**21IEPR6**	**Elective - III**	5	3	20	80	100	5
	IV	**21SEI61**	**SBE:** Python Programming Lab	2	3	40	60	100	2
	IV	**214VE6**	Value Education	2	3	25	75	100	2
	V	**215NS4/ 215PE4**	Extension Activities N.S.S / Physical Education	-	3	25	75	100	1

Annexure - 8

Electives:

Semester - V

Elective- I (Choose any one)

1. Client Server Computing - **21IE5A**
2. Android Programming - **21IE5B**
3. Pattern Recognition - **21IE5C**

Semester – VI

Elective - II (Choose any one)

1. Cloud Computing - **21IE6A**
2. Digital Image Processing - **21IE6B**
3. Cyber Security - **21IE6C**

Elective - III

Project - **21IEPR6**

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DEPARTMENT OF INFORMATION TECHNOLOGY-UG

(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper	**: Programming in Java**	
Semester	**: V**	**Contact Hours: 5**
Subject Code	**: 21I51**	**Credits : 4**

Objectives:

1. To introduce the features of object oriented programming languages using Java.
2. To provide an introduction to Java and enable the student to create simple Web based applications using Java Applets.
3. To have a basic idea about Graphics programming using Java.

Unit-I:

Fundamentals of Object-Oriented Programming: Introduction – Object-oriented Paradigm – Basic concepts of OOP – Benefits of OOP – Applications of OOP.

Java Evolution: Java History – Java Features – Java Differs from C & C++ - Java and Internet – Java Environment.

Overview of Java Language: Introduction – Simple Java Program – More of Java – Application with two classes – Java Program structure – Java Tokens – Java statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments.

Constants, Variables and Data Types: Introduction – Constants – Variables – Data Types – Declaration of variables – Giving values to variables – Scope of variables – Symbolic constants – Type casting – Getting values of variables – Standard default values.

Unit-II :

Operators and Expressions: Introduction – Arithmetic operators – Relational operators – Logical operators – Assignment operators – Increment and Decrement

operators – Conditional operators – Bitwise operators – Special operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic operators – Type conversions in Expressions – Mathematical Functions.

Decision Making and Branching: Introduction – Decision making with IF statement – The Switch statement – The ?: operator - **Decision Making and Looping:** The While Statement – The do statement – The for statement – Jumps in loops – Labeled Loops- **Arrays, Strings and Vectors:** Introduction-One Dimensional Arrays-Creating an Array- Two Dimensional Arrays-Strings-Vectors-Wrapper Classes-Enumerated Types

Unit-III:

Classes, Objects and Methods: Introduction Defining a class- Fields Declaring-methods Declaration –Creating Objects- Accessing Class Members- Constructors- method Overloading-Static Members-Nesting of Methods—Inheritance: Extending a Class-Overriding methods-Final Variables and Methods-Final classes-Finalizer Methods-Abstract Method and Classes-Methods with Varargs-Visibility Control

Interfaces: Multiple Inheritances: Defining Interfaces – Extending interfaces – Implementing Interfaces – Accessing Interface Variables.

Unit-IV:

Packages: Java API Packages – Using System Packages – Naming Conventions – Creating packages – Accessing a Package – Using a Package – Adding a class to a Package.

Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority – Synchronization – Implementing the 'Runnable' Interface.

Unit-V:

Managing Errors and Exceptions: Introduction – Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple catch statements – Using Finally statement – Throwing our own Exception – Using Exception for Debugging.

Applet Programming: Introduction – Applets Vs Applications – Building Applet code – Applet Life Cycle – Designing a Web page – Applet Tag –Adding applet to Html

file –Passing parameters to Applets – Displaying Numerical values – Getting Input from the User.

Graphics Programming: introduction – The Graphics Class – lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing polygons – Line Graphs – Using Control oops in applets – Drawing bar Charts.

Text Book:

Balagurusamy .E, *Programming with Java A Primer,* Tata McGraw Hill Publishing Company Limited, New Delhi, Fifth Edition (First reprint), 2015.

Chapters:

Unit I	:	Chapters 1,2,3 & 4
Unit II	:	Chapters 5,6,7 & 9
Unit III	:	Chapters 8 &10
Unit IV	:	Chapters 11 & 12
Unit V	:	Chapters13, 14 & 15

Reference Books:

1) David Holmes, James Gosling, Ken Arnold, *The Java Programming Language,* Addison Wesley Longman (Singapore) Pvt. Ltd., Indian Branch, New Delhi, Third Edition, 2000.

2) Dr.Muthu.C, *Programming with Java,* Vijay Nicole Imprints Private Limited., Chennai, Second Edition, 2010.

3) Patrick Naughton, *The Java Handbook,* Tata McGraw-Hill Publishing Company Ltd., New Delhi, Twenty Third Reprint, 2007.

4) Somasundaram.K, *Advanced Programming in Java 2,* Jaico Publishing House, Mumbai, First Edition, 2008.

5) Xavier.C, *Programming with Java 2,*Scitech Publications (India) Pvt. Ltd., Chennai, Fourth Reprint, 2005.

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DEPARTMENT OF INFORMATION TECHNOLOGY-UG

(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper	**: Computer Graphics**	
Semester	**: V**	**Contact Hours: 5**
Subject Code	**: 21I52**	**Credits : 4**

Objectives:

1. This course will focus on the theoretical aspects and implementation of computer graphics.
2. Have to learn the concept of Transformation of an object such as Translation, Rotation and Scaling.
3. The students will be able to understand the Graphics primitives and Two Dimensional Object Creation & Manipulation Techniques.

Unit – I:

A Survey of Computer Graphics: Computer Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image Processing – GUI. **Overview of Graphics Systems:** Video Display Devices- Raster Scan System – Random Scan System – Graphics Monitors and Workstations – Input Devices – Hard Copy Devices – Graphics Software.

Unit - II:

Output Primitives: Points and Lines – Line Drawing Algorithms – Circle Generating Algorithms – Ellipse Generating Algorithms – Other Curves – Curve Functions - Pixel Addressing – Filled Area Primitives – Character Generation.

Unit - III:

Attributes of Output Primitives: Line Attributes – Curve Attributes – Color and Grayscale Levels – Area Fill Attributes – Character Attributes – Bundled Attributes – Inquiry Functions – Antialiasing.

Unit – IV:

Two Dimensional Geometric Transformation: Basic Transformations- Matrix representations and Homogeneous Coordinates - Composite Transformations - Other Transformations – Transformations between coordinate systems.

Unit - V:

Two Dimensional Viewing: The Viewing Pipeline - Viewing Coordinate Reference Frame - Window to viewport Coordinate Transformation - Two Dimensional Viewing Functions- Clipping Operations – Point Clipping – Line Clipping (Cohen-Sutherland, Liang-Barshy, Nicholl-Lee-Nicholl Line Clipping) – Polygon Clipping – Curve Clipping – Text Clipping – Exterior Clipping.

Text Book:

Donald Hearn, Pauline Baker.M, *Computer Graphic C Version,* Pearson Education, New Delhi, Second Edition, 2012.

Chapters:

Unit I	-	Chapters 1, 2
Unit II	-	Chapter 3 (3.1.3.2. 3.5,3.6. 3.7, 3.10,3.11, 3.14)
Unit III	-	Chapter 4
Unit IV	-	Chapter 5(5.1 to 5.5)
Unit V	-	Chapter 6

Reference Books:

1. Johnson, *Computer Graphics and application,* PHI publications, New Delhi, Third Edition, 2001.
2. Malay K. Pakhira, *Computer Graphics, Multimedia and Animation* , Prentice Hall Of India Pvt. Ltd., New Delhi, Second Edition, 2008.
3. Mukherjee D. P, *Fundamentals Of Computer Graphics And Multimedia,* Prentice Hall Of India Pvt. Ltd., New Delhi , First Edition,1999.
4. Steven Harrigton, *Computer Graphics,* Tata McGraw Hill publications, New Delhi, Second Edition, 2005.
5. Wikipedia, *Computer Graphics,* Tata McGraw Hill publications, New Delhi, Third Edition, 2007.

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(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper	**: Computer Networks**		
Semester	**: V**	**Contact Hours**	**: 5**
Sub Code	**: 21I53**	**Credits**	**: 4**

Objectives:

1. Identify the different types of network topologies and protocols.
2. Enumerate the layers of the OSI model and TCP/IP.
3. Understand and building the skills of sub netting and routing mechanisms.

Unit-I:

Introduction: Uses of Computer Networks - Network Hardware - Network Software - Reference Models: The OSI Reference Model - The TCP/IP Reference Model – A Comparison of the OSI and TCP/IP Reference Models.

Unit-II:

The Physical Layer: Guided Transmission Media - Wireless Transmission - Communication Satellites. The Data Link Layer: Data link layer design Issues - Error Detection and Correction.

Unit-III:

The Medium Access Control: The Channel Allocation Problem - Multiple Access Protocols - Ethernet - Data Link Layer Switching.

Unit-IV:

The Network Layer: Network Layer Design Issues - Routing Algorithms - Congestion Control Algorithms - Internetworking.

Unit-V:

The Transport Layer: The Transport Service - Elements of Transport Protocols. The Application Layer: DNS - The Domain Name System - Electronic Mail.

Text Book:

Andrew S.Tanenbaum, David J.Wetherall, *Computer Networks,* Pearson Education, New Delhi, 5th Edition, 2013.

Chapters:

Unit 1 - Chapter 1 (1.1-1.3, 1.4.1, 1.4.2, 1.4.4)

Unit 2 - Chapters 2 & 3 (2.2 - 2.4, 3.1, 3.2)

Unit 3 - Chapter 4 (4.1 - 4.3, 4.8)

Unit 4 - Chapter 5 (5.1 - 5.3, 5.5)

Unit 5 - Chapters 6 & 7 (6.1, 6.2, 7.1, 7.2)

Reference Books:

1. Behrouz A.Forouzan, *Data Communications and Networking,* Tata McGraw Hill Publications, New Delhi, 22nd Reprint, 2011.
2. Brijendra Singh, *Data communications and Computer Networks,* PHI Learning Private Limited, New Delhi, 2nd Edition, 2009.
3. Barry Dumas.M, Morris Schwartz, *Principles of Computer Networks and Communications,* Pearson Education, New Delhi, IV edition, 2006.
4. Fred Halsall, *Data Communications, Computer Networks and Open Systems,* Pearson Education, New Delhi, IV edition, 2003.
5. William Stallings, *Data and Computer Communications,* Pearson Education, New Delhi, 7th Edition, 2004.

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(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper	**: Programming in Java Lab**	
Semester	**: V**	**Contact Hours: 6**
Subject Code	**: 21I5P**	**Credits : 4**

PROGRAMS LIST:

1. Displaying default values of all primitive data types.
2. Arrays and Control Flow Statements.
3. Constructor
4. Runtime Exception and I/O Exception.
5. Implementing String functions.
6. Multithreading.
7. Implementing Classes and Object.
8. Single Inheritance.
9. Multiple Inheritance - Implementing Interface Methods.
10. Package Implementation.
11. Merging of two Files.
12. Client / Server Communication using Network Methods.
13. GUI Components (List box, Check box, Menus, etc.,).
14. Event Handling (Mouse Event / Key Event)
15. Implementing Graphics Class Methods.
16. Image Animation.
17. Login Authentication using Applet.
18. Marquee of Text using Java Applet.
19. Design Traffic Signal using an Applet.
20. Polygon Shape using an Applet
21. Factorial Calculation using Applet
22. Display Digital Clock in Applet

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(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper : Client Server Computing
Semester : V **Contact Hours: 5**
Sub Code : 21IE5A **Credits : 5**

Objectives:

1. Conceptualize the basics of Client Server Computing.
2. Identify the different types of Client and Server Operating Systems.
3. Familiarity with the Testing and Diagnostic Tools of Server Operating System.

Unit-I:

Introduction to Client/server computing: Overview of Client/Server Computing: Client Server Computing - Benefits of Client/Server Computing. **Evolution of Client/Server Computing:** Hardware Trends - Software Trends. **Overview of Client/Server Applications:** Components of Client/Server Applications - Classes of Client/Server Applications - Categories of Client/Server Applications.

Unit-II:

Understanding Clint/Server Computing: Dispelling the Myths - Obstacles-Upfront and Hidden - Open Systems and Standards – Standards - Setting Organizations - Factors for Success. **The Client: Client Hardware and Software:** Client Components - Client Operating Systems - What is GUI - X Window Vs Windowing - Database Access - Application Logic. **Client Software Products:** GUI Environments - Converting 3270/5250 Screens - Database Access Tools.

Unit-III:

Client Requirements: GUI Design Standards - GUI Design Standards - Open GUI Standards - Interface Independence - Testing Interface - Development Aids. **The Server:** Server Hardware – Benchmarks - Categories of Servers - Features of Server Machines - Classes of Server Machines. **Server Environment:** Eight Layers of Software - Network

Management Environment - Network Computing Environment – Extensions -Network Operating System - Loadable Modules.

Unit-IV:

Server Operating Systems: OS/2 2.0 - Windows New Technology – UNIX -Based Operating Systems. **Server Requirements:** Platform Independence - Transaction Processing - Connectivity - Intelligent Database - Stored Procedures – Triggers - Load Leveling – Optimizer - Testing and Diagnostic Tools – Reliability - Backup and Recovery Mechanisms.

Unit-V:

Server Data Management and Access Tools: Data Manager Features - Data Management Software - Database Gateways. **Overview of Networking:** Layers, Interfaces, and Protocols-Standard Architecture - Network Characteristics - Network Management Standards - LAN Characteristics.

Text Book:

Dawna Travis Dewire, *Client/Server Computing*, McGraw Hill International Edition, New Delhi, First Edition, 2003.

Chapters:

Unit I	-	Chapters 1, 2 & 3
Unit II	-	Chapters 4, 5 & 6
Unit III	-	Chapters 7, 8 & 9
Unit IV	-	Chapters 10, 11
Unit V	-	Chapters 12, 13

Reference Books:

1. Bernard H.Boar, *Implementation client server computing*, McGraw Hill, New Delhi, First Edition, 1993.
2. Bruce R.Elbert, Boddy Martyna, *Client Server Computing*, Artech publisher, New Delhi, First Edition, 1994.
3. Patrick N.Smith, Steven L.Guengerich, *Client/Server Computing*, PHI Learing Private Limited, New Delhi, Second Edition, 2011.
4. William Marion, *Client/Server Strategies*, McGraw-Hill Professional, New Delhi, First Edition, 1994.
5. Ligon, Thomas Ligon, *Client server Communications Services*, McGraw-Hill Professional, NewDelhi, First Edition, 1997.

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(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper	**: Android Programming**	
Semester	**: V**	**Contact Hours: 5**
Sub Code	**: 21IE5B**	**Credits : 5**

Objectives:

1. To understand the basics of activities and multiple layouts.
2. To understand the usage of menus in designing widgets.
3. To acquire knowledge in handling database, files and notifications.

Unit-I:

Activities and Layout: Introduction-Declaring an Activity- Starting a new activity with an intent object-Switching between activities-Passing data to another activity-Returning a result from an activity-Saving an activity's state-Storing persistent activity data-Understanding the activity life cycle. **Layouts:** Introduction –Defining and inflating a layout- Using Relative layout- Using linear layout- Creating tables- Table Layout and Grid Layout-Recycler View replaces List View – Changing layout properties during runtime

Unit-II:

Views, Widgets and Styles: Introduction- Inserting a widget into a layout-Using Graphics to show button state-Creating a widget at runtime-Creating a custom component-Applying a style to a view-Turning a style into a theme-Selecting a theme based on the Android version. **Menus and Action Mode:** Introduction-Creating an options menu-Modifying menus and menu items during runtime-Enabling Contextual Action Mode for a view-Creating a pop-up menu.

Unit-III:

Fragments and System UI: Introduction-Creating and Using a Fragment-Adding and Removing Fragments during runtime-Passing data between Fragments. **Home Screen**

Widgets, Search and the System UI: Introduction- Creating a shortcut on the Home Screen-Creating a Home Screen widget- Adding Search to the Action Bar-Showing your App full-screen

Unit-IV:

Data Storage: Introduction-Storing simple data-Read and Write a text file to internal storage-Read and Write a text file to external storage-Including resource files in your project-Creating and Using an SQLite database-Accessing data in the background using a Loader-Accessing external storage with scoped directories in Android N. **Alerts and Notifications:** Displaying a message box with AlertDialog- Displaying a progress dialog-Making a Flashlight with a Heads-up Notification.

Unit-V:

Graphics and Animation: Using the Touchscreen and Sensors: Listening for click and long-press events- Pinch-to-zoom with multi-touch gestures- Reading sensor data-using Android Sensor Framework events- Reading device orientation. **Graphics and Animation**: Introduction-Scaling down large images to avoid Out of Memory exceptions-A transition animation-defining scenes and applying a transition- Creating a Compass using sensor data and RotateAnimation- Creating a slideshow with ViewPager-Creating a Card Flip Animation with Fragments-Creating a ZoomAnimation with a Custom Transition-Displaying Animated image (GIF/WebP) with the new ImageDecoder library-Creating a Circle image with the new ImageDecoder.

Text Book:

Rick Boyer Cookbook. (2018). **"***Android 9 Development"*. Packet Publishing Ltd. 3rd Edition.

Chapters:

Unit I **:** Chapter 1, 2

Unit II **:** Chapter 3, 4

Unit III **:** Chapter 5, 6

Unit IV **:** Chapter 7, 8

Unit V **:** Chapter 9, 10

Reference Books:

1. John Horton .*"Android Programming for Beginners"*. Packt Publishing. 1st Edition. 2015.
2. B.M.Harwan. *"Android Programming Unleashed".* Pearson Education. 2013.
3. Bill Phillips, Chris Stewart. *Android Programming.* O'Reilly Media Publishers. Third Edition. 2013.
4. Ian Darwin, "*Android Cookbook: Problems and Solutions for Android Developers*, Second Edition (Grayscale Indian Edition), 1 January 2017.
5. Keith Makan, Scott Alexander-Bown. *"Android Security Cookbook Paperback* ", 24 December 2013.

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(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper : Pattern Recognition
Semester : V **Contact Hours: 5**
Sub Code : 21IE5C **Credits : 5**

Objectives:

1. A good knowledge of Bayesian decision theory and Bayesian learning.
2. Fundamental understanding of classifiers such as linear discriminant function, quadratic discriminant function, nearest neighbor rule, neural network and SVM.
3. Ability to evaluate the performance of various classifiers on real-world datasets.

UNIT-I:

Pattern Classifier : Introduction - Data Sets for Pattern Recognition - Different Paradigms for Pattern Recognition - Representation -Data Structures for Pattern Representation - Patterns as Vectors- Patterns as Strings -Logical Descriptions -Fuzzy and Rough Pattern Sets -Patterns as Trees and Graphs - Representation of Clusters - Proximity Measures - Distance Measure - Weighted Distance Measure - Non-Metric Similarity Function - Edit Distance -Mutual Neighbourhood Distance (MND) - Conceptual Cohesiveness - Kernel Functions - Size of Patterns - Normalization of Data -Use of Appropriate Similarity Measures - Abstractions of the Data Set

UNIT-II:

Clustering : Introduction to Clustering- Hierarchical Algorithms - Divisive Clustering - Agglomerative Clustering - Partitional Clustering - k-Means Algorithm - Soft Partitioning- Clustering Large Data Sets - Possible Solutions - Incremental Clustering - Divide-and-Conquer Approach

UNIT-III:

Linear Classifiers: Introduction - Linear Discriminant Functions and Decision Hyper planes - The Perceptron Algorithm - Least Squares Methods –STOCHASTIC Approximation and LMS Algorithm -Mean Square Error Estimation - Mean Square Error Regression -The Bias-Variance Dilemma -Separable Classes –Non-separable Classes

UNIT-IV:

Hidden Markov Models And Support Vector Machine: Markov Models for Classification - Hidden Markov Models - HMM Parameters - Learning HMMs - Classification Using HMMs - Classification of Test Patterns-Linear Discriminant Functions- Learning the Linear Discriminant Function- Learning the Weight Vector - Multi-class Problems - Generality of Linear Discriminants- SVM for Classification - Linearly Separable Case - Non-linearly Separable Case

UNIT-V:

Feature Selection and Extraction: Feature selection - Feature selection criteria - Search algorithms for feature selection -Suboptimal search algorithms - Linear feature extraction - Principal components analysis –Karhunen–Loeve transformation -Factor analysis-Multidimensional scaling - Classical scaling -Metric multidimensional scaling -Ordinal scaling-Algorithms -Multidimensional scaling for feature extraction

Text Books:

1. M. Narasimha Murthy and V. Susheela Devi, "Pattern Recognition", Springer 2011.
2. S.Theodoridis and K.Koutroumbas, "Pattern Recognition", 4th Ed., Academic Press,
   2009
3. Andrew Webb, "Statically Pattern Recognition", Arnold publishers, London,1999.

UNIT I	-	Chapters 1,2 (Text Book 1)
UNIT II	-	Chapters 9 (Text Book 1)
UNIT III	-	Chapters 3 (Text Book 2)
UNIT IV	-	Chapter 5,7(Text Book 1)
UNIT V	-	Chapter 9 (Text Book 3)

Reference Books:

1. "Pattern Recognition Statistical, Structural and Neural Approaches" Robert J.Schalkoff, John Wiley & Sons Inc., New York, 1992.
2. Pattern Recognition and Machine Learning" C.M.Bishop, ", Springer, 2006.
3. "Pattern Classification" R.O.Duda, P.E.Hart and D.G.Stork, , John Wiley, 2001
4. "Stastical Pattern Recognition" Andrew Webb, Arnold publishers, London,1999.
5. K. Fukunaga, Introduction to Statistical Pattern Recognition, 2nd Ed. Academic Press, New York, 1990.

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(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper	**: Multimedia Lab**		
Semester	**: V**	**Contact Hours**	**:2**
Subject Code	**: 21SEI5P**	**Credits**	**:2**

ADOBE PHOTOSHOP PROGRAMS

1. Basic tools used in Photoshop.
2. Design an image by applying mirror effect.
3. Design an image by applying Text and Transform Tool.
4. Design an image by using patch or healing brush tool to remove damaged parts of an image.
5. Design an image by applying Color Balance to change the color of an image.
6. Design an image by using Clone Stamp Tool, Smudge Tool.
7. Design an image by applying Blur Filter.
8. Design an image by applying Lighting effect Filter.
9. Design an image by applying Blending options to make a text effect.
10. Design an image by applying rainbow effect.
11. Design an image by applying text masking effect.
12. Design a college id card using any tools.
13. Design a banner for your college with images and text.

FLASH PROGRAME

1. Basic tools used in Flash.
2. Develop a Flash application using motion tween.
3. Develop a Flash application using shape tween.
4. Develop a Flash application for ball bouncing using motion guide path.
5. Develop a Flash application for masking effect.
6. Develop a Flash application using layer based animation.
7. Develop a Flash application to represent the growing moon
8. Write action script to play and stop an animation.
9. Write action script to find the biggest of three numbers.
10. Write action script to find the factorial of a number.

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DEPARTMENT OF INFORMATION TECHNOLOGY-UG

(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper	**: Software Engineering**	
Semester	**: VI**	**Contact Hours: 5**
Subject Code	**: 21I61**	**Credits : 4**

Objectives:

1. To establish and evolving methodologies for the analysis, design and development of a Software.
2. To Estimate the cost factors for the development of a software product.
3. To Comprehend the Managerial Aspects of Software Maintenance.

Unit–I:

Introduction to Software Engineering: Some Definitions - Some Size factors - Quality and productivity factors - Managerial Issues. Planning a software project: Defining the problem - Developing a Solution Strategy - Planning the Development Process - Planning an Organizational structure - Other Planning Activities.

Unit-II:

Software Cost Estimation: Software Cost Factors - Software Cost Estimation Techniques - Staffing Level Estimation – Estimating software Maintenance costs.

Unit-III:

Software Requirements Definition: The software Requirements Specification - Formal Specification Techniques - Languages and Processors for Requirements Specifications.

Unit-IV:

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 Inspection - Design Guidelines.

Unit-V:

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.

Text Book:

Richard E. Fairly, *Software Engineering Concepts,* McGraw Hill Book company, New Delhi, 38th Reprint, 2012.

Chapters:

Unit I	-	Chapters 1& 2
Unit II	-	Chapter 3
Unit III	-	Chapter 4
Unit IV	-	Chapter 5
Unit V	-	Chapters 8 & 9

Reference Books:

1. Jones &Bartlett, *Essentials of Software Engineering, Jones & Bartlett* Publishers, New Delhi, First Edition, 2010.
2. Pankajjalote, *Integrated approach to Software Engineering,* Tata McGraw-Hill, New Delhi, Third Edition, 2012.
3. Roger S.Pressman, *Software Engineering , Tata* McGraw Hill Edition, New Delhi, Fifth reprint, 2012.
4. Robert-Facts & Fallacies, *Software Engineering, Beverly Publications, USA,* Second Edition, 2011.
5. Summervill, *Software Engineering,* Pearson Education, Newyork, 7th Edition, 2010.

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DEPARTMENT OF INFORMATION TECHNOLOGY-UG

(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper : Data Mining and Warehousing
Semester : VI **Contact Hours: 5**
Sub Code : 21I62 **Credits : 4**

Objectives:

1. To equip the students in the knowledge of various tools and techniques involved in Data Mining and Warehousing.
2. To introduce the concept of data mining with in detail coverage of basic tasks, metrics, issues, and implication. Core topics like classification, clustering and association rules are exhaustively dealt with.
3. To introduce the concept of data warehousing with special emphasis on architecture and design.

UNIT-I:

Introduction: Data Mining – Data Mining on what kind of Data – What kind of Patterns can be Mined - Which Technologies are used - Which kind of applications are targeted - Major issues in Data Mining.

UNIT-II:

Data Preprocessing: Data preprocessing an overview-Data cleaning-Data Reduction-Data Transformation and Data Discretization.

UNIT-III:

Data Warehousing and On-Line Analytical Processing: Data Warehouse Basic concepts - Data Warehouse modeling Data cube and OLAP - Data Warehouse design and usage - Data Warehouse implementation-Data generalization by attribute-oriented induction.

UNIT- IV:

Classification Basic Concepts: Basic Concepts - Decision Tree induction - Bayes classification methods - Rule-Based Classification - Model Evaluation and selection - Techniques to improve classification Accuracy.

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UNIT-V:

Cluster Analysis Basic concepts and Methods: Cluster Analysis - Partitioning Methods - Hierarchical Methods - Density-Based Methods - Grid –Based Methods -Evaluation of Clustering.

Text Book:

Jiawei Han & Micheline Kamber, "*Data Mining Concepts and Techniques*, Morgan Kaufmann Publishers, New Delhi, Third Edition, 2013.

Chapters:

Unit I : Chapter 1(1.1 to 1.7)
Unit II : Chapter 3 (3.1 to 3.5)
Unit III : Chapter 4 (4.1 to 4.5)
Unit IV : Chapter 8 (8.1 to 8.6)
Unit V : Chapter 10 (10.1 to 10.6)

Reference Books:

1. Alex Berson, Stephen Smith.J , *Data Warehousing* , Data Mining & OLA, Tata Mc Graw Hill Education Pvt. Ltd, New Delhi, Eighteenth reprint, 2010.
2. Arun K.Pujari , *Data Mining Techniques*, Universities Press (India) Pvt Ltd, Hyderabad , Second Edition , 2010.
3. Bharat Bhushan Agarwal, Sumit Prakash Tayal , *Data Mining and Data Warehousing*, University Science Press Laxmi Publications Pvt.Ltd, First Edition, Reprint 2014.
4. Dennis Murray , Sam Anahory , *Data Warehousing in the Real World* , Dorling Kindersley (India) Pvt Ltd , New Delhi , Fifth Edition , 2009.
5. Richard J.Roiger, Michael W.Geatz, Data Mining, Pearson Education, New Delhi, First Impression, 2007.

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(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper : Web Technology Lab
Semester : VI **Contact Hours: 6**
Sub Code : 21I6P **Credits : 4**

Java Script:

1. Odd Number Generation using Java Script
2. Fibonacci Series using Java Script
3. To Check a Number Palindrome or Not
4. Perform All Arithmetic Operation
5. To Search an elements in a dynamic Array

VB .NET:

6. Adding methods to class
7. Program for Class Event
8. Program for Inheritance
9. List to Add or Remove an Item
10. Date Time Picker-To view files on a particular date
11. Program for Track bar Control
12. Program for Common dialog Control
13. Program for Tree View control
14. Program for Menu Editor

ASP .NET:

15. Write a console application that obtains four int values from the user and displays the product
16. Write an application that uses two command-line arguments to place values into a string and an integer variable, respectively. Then display these values.
17. Write programs using conditional statements and loops:
    Generate various patterns (triangles, diamond and other patterns) with numbers.
18. Check whether the number in the textbox 'getnum' is palindrome or not.
19. List of employees is available in list box. Write an application to add selected or all records from list box (assume multi-line property of textbox is true)
20. "How is the book ASP.NET with c# by Vipul Prakashan?" Give the user three choices: i) Good ii) Satisfactory iii) Bad. Provide a VOTE button. After user votes, present the result in percentage using labels next to the choices.

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(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper : Cloud Computing
Semester : VI **Contact Hours : 5**
Sub Code : 21IE6A **Credits : 5**

Objectives:

1. Analyze the various Cloud concepts and Technologies.
2. Have to knowledge in Cloud based Services and Applications.
3. To learn the basic python programming for cloud services.

Unit: I

Introduction to Cloud Computing: Introduction – Characteristics of Cloud Computing – Cloud Models – Cloud-based Services & Applications. **Cloud Concepts & Technologies:** Virtualization – Load Balancing – Scalability & Elasticity – Deployment – Replication – Monitoring – Software Defined Networking – Network Function Virtualization – MapReduce.

Unit: II

Cloud Services & Platforms: Compute Services – Storage Services – Database Services – Application Services – Content Delivery Services. **Hadoop & MapReduce:** Apache Hadoop – Hadoop MapReduce Job Execution – Hadoop Schedulers.

Unit: III

Cloud Application Design: Introduction – Design Considerations for Cloud Applications – Reference Architectures for Cloud Applications – Cloud Application Design Methodologies – Data Storage Approaches.

Unit: IV

Python Basics: Introduction – Python Data Types & Data Structures – Control Flow – Functions – Modules – Packages – File Handling – Date/Time Operations – Classes. **Python for Cloud:** Python for Amazon Web Services.

Unit: V

Cloud Security: Introduction – CSA Cloud Security Architecture – Authentication – Authorization – Identity & Access Management – Data Security. **Cloud for Industry, Healthcare & Education:** Cloud Computing for Healthcare – Cloud Computing for Manufacturing Industry – Cloud Computing for Education.

Text Book:

Arshdeep Bahga, Vijay Madisetti, *Cloud Computing: A Hands-on Approach*, University Press(India) Private Limited, Hyderabad, 2th Edition, 2016.

Chapters:

Unit 1 - Chapters 1 (1.1-1.3, 1.5) & 2 (2.1 - 2.9)
Unit 2 - Chapters 3 (3.1 - 3.5) & 4 (4.1 - 4.3)
Unit 3 - Chapter 5 (5.1 - 5.5)
Unit 4 - Chapters 6 (6.1 - 6.10) & 7 (7.1)
Unit 5 - Chapters 12 (12.1 - 12.6) & 13 (13.1, 13.4, 13.5)

Reference Books:

1. John W.Rittinghouse and James F.Ransome, *Cloud Computing: Implementation, Management, and Security*, CRC Press, United States, 2010.
2. Katarina Stanoevska-Slabeva, Thomas Wozniak, *SantiRistol, Grid and Cloud Computing – A Business Perspective on Technology and Applications*, Springer, Chennai, 2010.
3. Kumar Saurabh, *Cloud Computing – insights into New-Era Infrastructure*, Wiley India, New Delhi, 2011.
4. Rajkumar Buyya, Christian Vecchiola, S.ThamaraiSelvi, *Mastering Cloud Computing*, Tata McGraw Hill Education Private Limited, New Delhi, 2013.
5. Ronald L. Krutz, Russell Dean Vines, *Cloud Security – A comprehensive Guide to Secure Cloud Computing*,Wiley – India, New Delhi, 2010.

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(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper : Digital Image Processing
Semester : VI **Contact Hours: 5**
Sub Code : 21IE6B **Credits : 5**

Objectives:

1. Identify the image fundamentals and mathematical transforms necessary for image processing.
2. Learn the functionalities of spatial and frequency filters for image enhancement.
3. To identify the requirements of various image segmentation methods and object recognition models for various real-time applications.
4. Get broad exposure to and understanding of color image processing models.
5. To analyze the functionalities of Morphological Image processing method.

Unit-I:

Digital Image Processing: Origins of Digital Image Processing, Steps in Digital Image Processing, Digital Image Fundamentals: Elements of Visual Perception, Light and the Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization, Basic Relationships between Pixels, Mathematical Tools used in Digital Image Processing.

Unit-II:

Image Transformation & Filters: Basic Intensity Transformation Functions, Histogram Processing, Fundamentals of Spatial Filtering, Smoothing Spatial Filter, Sharpening Spatial Filters, Combining Spatial Enhancement methods, Fuzzy techniques for Intensity Transformation and Spatial Filtering. Filtering in the Frequency Domain: Sampling and the Fourier Transforms of Sampled Functions, The Properties of the 2-D DFT, Filtering in the Frequency Domain, Image Smoothing and using Frequency Domain Filters, Selective Filtering.

Unit-III:

Image Restoration, Reconstruction and Image Segmentation: Image Degradation/Restoration process, Noise Models, Restoration in the presence of Noise only-Spatial Filtering, stimating the Degradation Functions, Inverse Filtering, Wiener Square Error Filtering, Constrained Least Square Filtering, Geometric Mean Filter, Image Reconstruction from Projections. Image Segmentation: Point, Line and Edge Detection, Thresholding, Region-Based Segmentation, Use of Motion in Segmentation

Unit-IV:

Color Image Processing: Color Fundamentals, Color Models, Pseudo color Image Processing, Full Color Image Processing, Color Transformation, Smoothing and Sharpening, Image Segmentation Based on Color, Noise in Color Images. Wavelets and Multi resolution Processing: Multi resolution Expansion, Wavelet Transforms in One Dimension, The Fast Wavelet Transforms, Wavelet Transforms in Two Dimensions, Wavelet Packets. Image Compression: Fundamentals, Basic Compression Methods, Digital Image Watermarking

Unit-V:

Morphological Image Processing: Erosion and Dilation, Opening and Closing, The Hit-Or-Miss Transformation, Basic Morphological Algorithms, Gray-Scale Morphology. Object Recognition: Patterns and Pattern Classes, Recognition Based on Decision-Theoretic Methods, Structural Methods.

Text Book:

Rafael C. Gonzalez, Richard E. Woods. (2008).*"Digital Image Processing".* Third Edition, Pearson Education.

Chapters:

Unit I	:	Chapter 1 and 2
Unit II	:	Chapter 3 and 4(4.1, 4.3, 4.7, 4.8, 4.10)
Unit III	:	Chapter 5(5.1, 5.2, 5.3, 5.7 to 5.11) and 10 (10.2, 10.3, 10.4, 10
Unit 1V	:	Chapter 6 and 7
Unit V	:	Chapter 9 and 12

Reference Books:

1. Chanda B, Dutta Majumdar.D. *Digital Image Processing and Applications*. Prentice Hall of India. New Delhi. Second Edition. 2007.
2. Jain A.K. *Fundamentals of Digital Image Processing*. Pearson education References, New Delhi.Second Edition. 2004.
3. Millman Sonka, Vaclav Hlavac, Roger Boyle & Broos Colic. *Image Processing Analysis and Machine Vision* . Thompson Learning, USA. Low Price Edition. 2002.
4. Rafael C Gonzalez, Richard E Woods. *Digital Image Processing*. Pearson Education . New Delhi. Second Edition. 2003.
5.William K Pratt. *Digital Image Processing*.John Willey & Sons Inc. New Delhi. Third Edition. 2002.

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Title of the Paper : Cyber Security
Semester : VI **Contact Hours: 5**
Sub Code : 21IE6C **Credits : 5**

Objectives:

1. To have knowledge on the use of cryptography and network security.
2. To explore the basic issues to be addressed by program security capabilities.
3. To develop an organizational security policies such as authentication, Reliability and Integrity.

Unit-I:

Cryptography: Terminology and Background – Substitution Ciphers – Transpositions – Making Good Encryption Algorithms- Data Encryption Standard-AES Encryption Algorithm – Public Key Encryption – The Uses of Encryption.

Unit-II:

Program Security: Secure programs – Non-malicious Program Errors – Viruses and other Malicious Code – Targeted Malicious code – Controls Against Program Threat.

Protection in General-Purpose Operating System: Protected Objects and Methods of Address Protection – Control of Access to General Objects – File Protection Mechanisms - User Authentication.

Unit-III:

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

Unit-IV:

Security in Networks: Threats in networks – Network Security Controls – Firewalls – Intrusion Detection Systems – Secure e-mail.

Unit-V:

Administering Security: Security Planning – Risk Analysis – Organizational Security Policies – Physical Security.

Text Book:

Charles P. Pfleeger, Shari Lawrence Pfleeger, *Security in Computing*, Pearson Education, New Delhi, Third Edition, 2011.

Chapters:

Unit I : Chapter 2

Unit II : Chapters 3, 4

Unit III : Chapter 6

Unit IV : Chapter 7

Unit V : Chapter 8

Reference Books:

1. Mao.W, *Modern Cryptography – Theory and Practice*, Pearson Education, New Delhi, Second Edition, 2007.
2. Michael Whitman, Herbert J. Mattord, *Management of Information Security*, Course Technology, Boston US, Third Edition, 2010.
3. MY Rhee, *Network Security*, John Wiley and Sons, New York, Second | Edition, 2002.
4. Wade Trappe, Lawrence C Washington, *Introduction to Cryptography with coding*, Pearson Publication, New Delhi, Second Edition, 2007.
5. William Stallings, *Cryptography and Network security: Principles and Practices*, PHI Publication, New Delhi, Fifth Edition, 2010.

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Title of the Paper	**: Project**	
Semester	**: VI**	**Contact Hours: 5**
Sub Code	**: 21IEPR6**	**Credits : 5**

Objectives:

1. The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
2. Each student should carry out the Project Work and it may be a work using the

   software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea.

* Exam will be conducted as follows

- Viva-voce will be conducted at the end of VI semester for 100 marks.
- Both the Internal (Respective Guides) and External Examiners (20+80) should conduct the Viva-Voce Examination.
- For awarding a pass, a candidate should have obtained 40% of the Total 100 marks.

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(w.e.f. 2021– 2022 Batch onwards)

Title of the Paper : Python Programming Lab
Semester : VI **Contact Hours: 2**
Sub Code : 21SEI61 **Credits : 2**

PROGRAM LIST

1. Write a Python program to print all Prime numbers in an Interval.
2. Write a Python program to print N^{th} Fibonacci number using recursion.
3. Write a Python program to sort the given n numbers.
4. Write a Python program to implement any 5 string operations.
5. Write a Python program to extract date from the given string and validate the mobile number.
6. Write a Python program to read data from a file and calculate the percentage of vowels and consonants in the file.
7. Write a Python program to create a file and display its contents.
8. Write a Python Program to perform append, insert, pop, reverse, sort methods in list.
9. Write a Python program to add two matrices (using nested lists).
10. Write a Python program to perform repetition, membership, maximum and minimum operations in Tuple.
11. Write a Python program to perform union, intersection, difference, symmetric difference and enumerate operation in Sets.
12. Create a menu driven Python program with a dictionary for words and their meanings.
13. Write functions to add a new entry (word: meaning), search for a particular word and retrieve meaning, for given meaning find words with the same meaning, remove an entry, display all words sorted alphabetically.