

E.G.S. PILLAY ENGINEERING COLLEGE

(Autonomous)

Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai Accredited by NAAC with “A” Grade |
Accredited by NBA (CSE, EEE, MECH, CIVIL, ECE, IT)

NAGAPATTINAM – 611 002



MASTER OF COMPUTER APPLICATIONS

Curriculum and Syllabi

First Year – Second Semester

SEMESTER II										
Course Code	Course Name	L	T	P	C	Maximum Marks			Category	
						CIA	ES	Total		
Theory Course										
2002CA201	Advanced Java Programming	3	-	-	3	40	60	100	PC	
2002CA202	Mobile Technologies	3	-	-	3	40	60	100	PC	
2002CA203	Data Mining Techniques	2	-	2	3	50	50	100	PC	
2002CA204	Internet of Things	2	-	2	3	50	50	100	PC	
2002CA205	Professional Practice and Ethics	3	-	-	3	40	60	100	PC	
	Elective – I	3	-	-	3	40	60	100	PE	
	Audit Course II*	2	-	-	-	100	0	100	AC	
2002CA206	Java and Web Programming Laboratory	-	-	4	2	50	50	100	PC	
2002CA207	Mobile Application Development Lab	-	-	4	2	50	50	100	PC	
2004CA208	Life Skill II- Aptitude I	-	-	2	1	100	-	100	EEC	
Total		18	0	14	23	560	440	1000		

*Audit course is optional

2002CA201

ADVANCED JAVA PROGRAMMING

L	T	P	C
3	0	0	3

PREREQUISITE :

1. Programming Concepts using C and C++

COURSE OBJECTIVES:

1. To understand and apply the fundamentals core java, packages, database connectivity for computing
2. To enhance the knowledge to server-side programming
3. To provide knowledge on advanced features like Swing , Sockets and MVC architecture.

UNIT I JAVA FUNDAMENTAL

08 Hours

Java features – Java Platform – Expressions, Operators, and Control Structures – Classes, Methods and Inheritance- Packages and Interfaces – Exception Handling - Garbage Collection – Multithreading

UNIT II GUI and I/O PROGRAMMING

09 Hours

AWT package – Layouts – Event Package – Event Model – Painting- Swing Fundamentals- Swing Classes- Working with Text Fields, Buttons, List and Scroll panes - Input Output Package

UNIT III JDBC AND WEB APPLICATION DEVELOPMENT

12 Hours

Accessing Database with JDBC – Basics – Manipulating Databases with JDBC – Overview of Servlets – Servlet API – Servlet Life Cycle – Servlet Configuration – Running Servlet with Database Connectivity – Session Tracking – Basics of JSP – Java Server Faces – Multitier Application Architecture – MVC Architecture of JSF Apps – Common JSF Components –Session Tracking.

UNIT IV DISTRIBUTED APPLICATION AND NETWORKING BASICS

07 Hours

Remote Method Invocation-Java and the Net – Inet Address – TCP/IP Client Sockets – URL –URL Connection – TCP/IP Server Sockets –Datagrams.

UNIT V ADVANCED FRAMEWORKS

09 Hours

Understanding Struts – MVC framework – Struts Control Flow –Building Model View Controller Component – Hibernate – Architecture – Understanding O/R mapping – Query language – Spring Framework – Architecture – Case Studies.

TOTAL: 45 HOURS

FURTHER READING:

1. Enterprise Java Beans

COURSE OUTCOMES:

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

- CO1: Develop programs using Java Classes, Interfaces and Exception Handling (K3)
- CO2: Create GUI application using AWT packages and Swing (K6)
- CO3: Create dynamic web applications with database connectivity using server-side technologies(K6)
- CO4: Design and Implement applications using RMI, TCP and UDP sockets(K3)
- CO5: Design and development of applications using advanced frameworks(K3)

REFERENCES:

1. “Core and Advanced Java, Black Book”, Dreamtech Press, 2018.
2. Paul J. Deitel, Harvey Deitel, “Java How to Program”, Eleventh Edition, Pearson,2017.
3. Cay S. Horstmann, “Core Java Volume I & II”, Pearson Education, 2018.
4. Herbert Schildt , “Java The Complete Reference”, Eighth Edition, Tata McGraw Hill,2011.
5. Paul Dietel, Harvey Dietel, Abbey Dietel, “Internet and World Wide Web”, Fifth Edition, Pearson Education, 2012.
7. <https://www.oracle.com/corporate/pressrelease/Java-10-032018.html>

2002CA202

MOBILE TECHNOLOGIES

L	T	P	C
3	0	0	3

PREREQUISITE :

1. Computer Networks

COURSE OBJECTIVES:

1. To understand the basics of wireless voice and data communication technologies.
2. To learn the basic concepts, aware of the GSM, Routing and GPRS Architecture.
3. To study the working principles of wireless LAN and its standards
4. To build knowledge on various Mobile Computing algorithms
5. To Know the Network, Transport Functionalities of Mobile communication
6. To understand the concepts of Adhoc and wireless sensor networks.

UNIT I WIRELESS COMMUNICATION FUNDAMENTALS

9 Hours

Introduction – Wireless transmission – Frequencies for radio transmission – Signals –Antennas – Signal Propagation – Multiplexing – Modulations – Spread spectrum – MAC– SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks- Comparison of 2G and 3 G .

UNIT II TELECOMMUNICATION SYSTEMS

9 Hours

GSM – Mobile services -System Architecture – Protocols – Localization and calling – Handover – Security – GPRS– System Architecture –Protocols- SMS Architecture- Value Added Service through SMS.

UNIT III MOBILE WIRELESS NETWORK SHORT RANGE NETWORKS

8 Hours

Introduction-WLAN Equipment-WLAN Topologies-WLAN Technologies-IEEE 802.11 Architecture- Protocol architecture- WAP Architecture- Bluetooth- Bluetooth Protocol- Security in Bluetooth- IrDA- ZigBee.

UNIT IV MOBILE NETWORK LAYER,TRANSPORT LAYER

9 Hours

Mobile IP– Mobile IP- Mobile IP – Goals – Assumptions and Requirement – Entities – IP packet Delivery –Agent Advertisement and Discovery – Registration – Tunneling and Encapsulation- IPv6 – DHCP – Ad hoc Networks- DSDV – DSR.- Traditional TCP – Indirect TCP – Snooping TCP – Mobile TCP – Fast Retransmit/ Fast Recovery – Transmission/ Timeout Freezing – Selective Retransmission .

UNIT V PLATFORMS AND RECENT TRENDS

10 Hours

Mobile Applications Development- Android Application Architecture- The Android Application Life Cycle- Creating User Interfaces- Appcelerator Architecture-types mobile os- Geo services- creating mobile applications like game, Clock, calendar, Convertor, phone book, Text Editor

TOTAL: 45 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR:

- 1.Mobile Adhoc Networks(MANET)

COURSE OUTCOMES:

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

- CO1: Analyze the terminals signal separation and cell capacity of SDMA, FDMA and CDMA in wireless communication. (K4)
- CO2: Categorize the GSM and GPRS system architecture in Telecommunication system. (K2)
- CO3: Categorize the System architectures and protocols of Wireless LAN. (K2)
- CO4: Analyze the performance of fast transmit and fast recovery for a given Mobile Network.
- CO5: Develop the game application using Android Controls. (K3)
- CO6: Develop the mobile application for location tracking system using GPRS.(K3)

REFERENCES:

1. Kaveh Pahlavan, Prasanth Krishnamoorthy, “Principles of Wireless Networks”, Pearson Education, 2003.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, New York, 2003.
3. C.K.Toh, “AdHoc Mobile Wireless Networks”, Prentice Hall Inc., 2002.
4. Jochen Schiller, “Mobile Communications”, Second Edition, Prentice Hall of India, Pearson Education, 2003.
5. William Stallings, “Wireless Communications and Networks”, Second Edition, Prentice Hall of India, Pearson Education, 2004.
6. https://www.tutorialspoint.com/mobile_computing/mobile_computing_pdf_version.html
7. <https://www.tutorialspoint.com/android/>

2002CA203

DATA MINING TECHNIQUES

L	T	P	C
2	0	2	3

PREREQUISITE :

1. Database Management Techniques

COURSE OBJECTIVES:

1. To Understand Data mining principles and techniques and Introduce DM as a cutting edge Business intelligence
2. To expose the students to the concepts of Data warehousing Architecture and Implementation.
3. To know the data mining techniques in details for better organization and retrieval of data
4. To learn to use association rule mining for handling large data
5. To identify Business applications and Trends of Data mining.

UNIT I DATA MINING & DATA PREPROCESSING 12 Hours

Introduction to KDD process – Knowledge Discovery from Databases - Need for Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction.

UNIT II ASSOCIATION RULE MINING 12 Hours

Introduction - Data Mining Functionalities - Association Rule Mining –Market Basket Analysis – Mining Frequent Itemsets with Candidate Generation –Mining Frequent Itemsets without Candidate Generation Mining Various Kinds of Association Rules

UNIT III CLASSIFICATION AND PREDICTION 12 Hours

Classification vs Prediction – Data preparation for Classification and Prediction –Naïve Bayes Classifier– Classification by Decision Tree Introduction –Associative Classification – Support Vector Machines – Prediction: Introduction –Accuracy and Error Measures – Evaluating the Accuracy of a Classifier or Predictor – Model Section

UNIT IV CLUSTERING AND CLUSTER ANALYSIS IN PYTHON 12 Hours

Cluster Analysis - Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods – Partitioning Methods – Hierarchical methods– Grid-Based Methods –Clustering High- Dimensional Data – Constraint-Based Cluster Analysis – Outlier Analysis.- K means clustering in python-DBSCAN-HAC.

UNIT V OPEN SOURCE DATA MINING TOOLS 12 Hours

Introduction –Rapid Miner-Attributes-Modeling-Design and Analysis process-Visualization

TOTAL: 60 HOURS

FURTHER READING:

1. Bootstrap

COURSE OUTCOMES:

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

- CO1: Preprocess the data for mining applications
- CO2: Apply the association rules for mining the data
- CO3: Design and deploy appropriate classification techniques
- CO4: Cluster the high dimensional data for better organization of the data
- CO5: Able to understand the Open Source Mining tools

REFERENCES:

1. Jiawei Han and MichelineKamber, “Data Mining Concepts and Techniques”, Second Edition, Elsevier, Reprinted 2011.
2. K.P. Soman, ShyamDiwakar and V. Ajay, “Insight into Data mining Theory and Practice”, Easter Economy Edition, Prentice Hall of India, 2006.
3. G. K. Gupta, “Introduction to Data Mining with Case Studies”, Easter Economy Edition
BERSON, ALEX & SMITH, STEPHEN J, Data Warehousing, Data Mining, and OLAP, TMH Pub..
4. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, “Introduction to Data Mining”, Pearson Education, 2007
5. MARAKAS, GEORGE M, Modern Data Mining, and Visualization, Pearson Education, 2011
6. George Seif’s article, “The 5 Clustering Algorithms Data Scientists Need to Know.”
7. www.wideskills.com/data-mining-tutorial/data-mining-techniques

Lab Modules:

Module 1

- 1.Explore visualization features of the tool for analysis and WEKA.
- 2.Perform data preprocessing tasks
3. Demonstrate performing association rule mining on data sets.
4. Demonstrate performing classification on data sets.
- 5.Demonstrate performing clustering on data sets.

Module 2

6. Navigate the options available in the WEKA(ex.select attributes panel,preprocess panel,classify panel,cluster panel,associate panel and visualize)
7. Explore the available data sets in WEKA.
8. List attribute names and types of Dataset in SuperMarket.
9. Plot Histogram of Different Datasets in the SuperMarket using WEKA Tool.
10. Load each dataset into Weka and run Apriori algorithm with different support and confidence values. Study the rules generated.

2002CA204

INTERNET OF THINGS

L	T	P	C
2	0	2	3

PREREQUISITE:

1. Computer Organization and Design
2. Computer Communications and Networks

COURSE OBJECTIVES:

1. To understand the fundamentals of Internet of Things.
2. To build a small low cost IoT application using Raspberry Pi and Arduino.
3. To apply the concept of Internet of Things in the real world scenario.

UNIT I FUNDAMENTALS OF IoT

12 Hours

Internet of Things – Physical Design – Logical Design – IoT Enabling Technologies – IoT Levels & Deployment Templates – Domain Specific IoTs – IoT and M2M – IoT System Management with NETCONF – YANG – IoT Platforms Design Methodology.

UNIT II IoT ARCHITECTURE

12 Hours

M2M high-level ETSI architecture – IETF architecture for IoT – OGC architecture – IoT reference model – Domain model – Information model – functional model – communication model – IoT reference architecture.

UNIT III IoT PROTOCOLS

12 Hours

Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFID Protocols – Unified Data Standards – Protocols – IEEE 802.15.4 – BACNet Protocol – Modbus – Zigbee Architecture – Network layer – 6LowPAN – CoAP – Security.

UNIT IV BUILDING IoT WITH RASPBERRY PI AND ARDUINO

12 Hours

Building IOT with Raspberry Pi – IoT Systems – Logical Design using Python – IoT Physical Devices & Endpoints – IoT Device –Building blocks – Raspberry Pi –Board – Linux on Raspberry Pi – Raspberry Pi Interfaces – Programming Raspberry Pi with Python – Other IoT Platforms – Arduino Basics – Arduino Software IDE – Arduino Boards – Arduino Programming Language – Developing IoT Applications using Arduino – Case study Applications.

UNIT V CASE STUDIES AND ADVANCED TOPICS

12 Hours

Real world design constraints – Applications – Asset management, Industrial automation, Smart grid, Commercial building automation, Smart cities – Participatory sensing – Data Analytics for IoT – Software & Management Tools for IoT– Cloud Storage Models & Communication APIs – Cloud for IoT – Amazon Web Services for IoT.

TOTAL: 60 HOURS

FURTHER READING:

FOG Computing

COURSE OUTCOMES:

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

- CO1: Explain the fundamentals of IoT. (K2)
- CO2: Describe the Architecture of IoT.(K2)
- CO3: Categorize the Protocols of IoT.(K2)
- CO4: Develop IoT applications using Raspberry Pi. (K3)
- CO5: Develop IoT applications using Arduino.(K3)
- CO6: Make use of Cloud to deploy real time IoT Applications.(K3)

REFERENCES:

1. ArshdeepBahga, VijayMadiseti, “InternetofThings–A hands–on approach”, Universities Press, 2015.
2. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), “Architecting the Internet of Things”, Springer, 2011.
3. Honbo Zhou, “The Internet of Things in the Cloud: A Middleware Perspective”, CRC Press, 2012.
4. Olivier Hersent, David Boswarthick, Omar Elloumi, “The Internet of Things – Key applications and Protocols”, Wiley, 2012.
5. ManoelCarlosRamon, “Intel@Galileo and Intel@GalileoGen2:API Features and ArduinoProjects for Linux Programmers”, Apress, 2014.
6. MarcoSchwartz, “Internetof Things with the ArduinoYun”, PacktPublishing, 2014.
7. "Internet of Things: Science Fiction or Business Fact?" (PDF). *Harvard Business Review*. November 2014. Retrieved 23 October 2016.
8. Kyriazis, D.; Varvarigou, T.; Rossi, A.; White, D.; Cooper, J. (4–7 June 2013). "Sustainable smart city IoT applications: Heat and electricity management & Eco-conscious cruise control for public transportation"
9. https://www.tutorialspoint.com/internet_of_things/
10. <https://www.edureka.co/blog/iot-tutorial/>

Lab Modules:

Module 1:

1. Exploring IoT Platforms and Tools
2. Demonstration of IoT Protocols in any IoT Toolkit
3. Exploring the Components of Arduino Board
4. Practical study of Raspberry Pi Board
5. Introduction to IoT Programming

Module 2:

6. Implementing Turning LED On or Off program using push button using IoT toolkit
7. Implementing Bluetooth interface with Arduino/Raspberry to send sensor data to Mobile Phone.
8. Implementing Temperature and Humidity printing using sensors
9. Implementing Object Distance calculation with IoT Toolkit
10. Demonstration of interfacing IoT with Cloud environment.

2002CA205

PROFESSIONAL PRACTICE AND ETHICS

L	T	P	C
3	0	0	3

PREREQUISITE :

Software Quality Assurance

COURSE OBJECTIVES:

1. To explore the basic software development ethics.
2. To make understand the essentials of the Project Management.
3. To provide knowledge on the various software architectures.
4. To expose the principles to be followed in OOAD.
5. To understand the ethics of software testing.

UNIT I INTRODUCTION

09 Hours

What We're Doing-How to Develop Software-A Model That's not a Model At All: Code and Fix-Cruising over the Waterfall-Evolving the Incremental Model-eXtreme Programming (XP)

UNIT II PROJECT MANAGEMENT ESSENTIALS

09 Hours

Project Planning- Project Organization-Risk Analysis-Resource Requirements-Work Breakdown and Task Estimates-Project Schedule-Project Oversight-Requirements: Types of Requirements-Requirements Digging.

UNIT III SOFTWARE ARCHITECTURE

09 Hours

General Architectural Patterns-Pipe-and-filter Architecture-An Object-Oriented Architectural Pattern-Design Process-Desirable Design Characteristics-Designers and Creativity

UNIT IV OBJECT-ORIENTED ANALYSIS AND DESIGN—AN OVERVIEW

09 Hours

An Object-Oriented Analysis and Design Process-Doing the Process-List of Fundamental Object-Oriented Design Principles-The Open-Closed Principle (OCP)- Don't Repeat Yourself Principle (DRY)- The Single Responsibility Principle (SRP).- Liskov Substitution Principle (LSP)- The Dependency Inversion Principle (DIP)- The Interface Segregation Principle (ISP)

UNIT V DESIGN PATTERNS

09 Hours

Approach to Debugging-Source Code Control-Unit Testing: The Problem with Testing-Characteristics of Tests-Walkthroughs-Code Reviews-Code Inspections

TOTAL: 45 HOURS

FURTHER READING:

Code of Ethics for Software Development

COURSE OUTCOMES:

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

- CO1: Analyze the architectures of the software development.
- CO2: Develop Project Plan using Project management principles.
- CO3: Compare different software architectural patterns used in software development.
- CO4: Apply object oriented design principles for developing software applications.
- CO5: Adapt testing principles in software testing.

REFERENCES:

1. Software Development and Professional Practice by John Dooley Printed and bound in the United States of America
2. Mike Martin and Roland Schinzinger, Ethics in Engineering, McGraw Hill, 4th Edition, 2005
3. Charles E Harris, Micheal S. Pritchard, Micheal Rabins, "Engineering Ethics - Concepts and Cases", Thompson Learning, 5th Edition, 2013
4. Charles D Fledderman, Engineering Ethics, Prentice Hall, New Mexico, 4th Edition, 2007
5. https://www.tutorialspoint.com/professional_ethics/professional_ethics_tutorial.pdf
6. <http://data.conferenceworld.in/25FebEMSSH/21.pdf>

2002CA206

JAVA AND WEB PROGRAMMING LABORATORY

L	T	P	C
0	0	4	2

Course Objectives: The student should be able to

1. To understand and apply the fundamentals of core Java
2. To implement inheritance, polymorphism, interfaces, multithreading, streaming, networking and RMI.
3. To develop web applications using client side and server-side programming.
4. To learn and use MVC architecture for application development.

List of Experiments:

1. Design and Implement java programs that deals with the following
 - a. Classes and Objects, Interfaces and User defined Packages
 - b. Exception Handling with user defined Exceptions.
 - c. Implementation of Thread Synchronization using any application.
2. Create applet application for Calculator, Fahrenheit to Centigrade conversion.
3. Create a Personal Information System using Swing
4. Reading and writing text files in Java
5. Create student information system using JDBC and servlet
6. Writing an RMI application to access a remote method
7. Reading websites using URL class.
8. FTP Using Sockets.
9. Development of Hibernate framework based application for O/R mapping
10. Web application development using Struts framework & Spring framework

TOTAL: 60 HOURS

ADDITIONAL EXPERIMENTS / INNOVATIVE EXPERIMENTS :

1. Creation and usage of Enterprise Java bean

Course Outcomes:

After completion of the course, Student will be

1. Design Java applications using classes, objects, interfaces, packages and Multithreading. (K3)
2. Develop programs for reading and writing text files using Java Streams.(K3)
3. Develop file transfer applications using sockets.(K3)
4. Create student information system using Servlet and JDBC. (K6)
5. Create Calculator application, Fahrenheit to Centigrade conversion using applets (K6)
6. Develop programs using Event Handling in Swing(K3)
7. Develop Java RMI application to access remote methods(K3)
8. Create Mini Projects using Java. (K6)

2002CA207

MOBILE APPLICATION DEVELOPMENT LABORATORY

L	T	P	C
0	0	4	2

Course Objectives:

1. To know about various platforms and tools available for developing mobile applications
2. To create a simple Android Application using Eclipse IDE.
3. To demonstrate the basic application using UI in android
4. To design android application using linear layout

List of Experiments: The following experiments to be practiced

1. Develop an application that uses GUI components, Font and Colours
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a tip calculator application.
4. Graphical and Multimedia applications
5. Developing an android application using Relative layout to display Date and time.
6. Develop an application that makes use of RSS Feed.
7. Develop a native application that uses GPS location information.
8. Implement an application that writes data to the SD card.)
9. Develop an application that makes use of database.
10. Mobile Chatting Application using TCP with mobile client
11. Mobile Chatting Application using UDP with Mobile Client
12. M-Commerce Applications
13. M-service Applications

Total:

60 Hours

ADDITIONAL EXPERIMENTS / INNOVATIVE EXPERIMENTS :

1. Create a mobile Application Development Tools
2. Develop the gaming Applications by use of Forms, Controls, Graphical and multimedia, Data retrieval Applications.

Course Outcomes:

After completion of the course, Student will be

1. Be able to develop useful mobile applications for the current scenario in mobile computing and pervasive computing

2004CA208 LIFE SKILL II - APTITUDE – I

L T P C
0 0 2 1

Course Objective (s):

- To brush up problem solving skill and to improve intellectual skill of the students
- To be able to critically evaluate various real life situations by resorting to Analysis Of key issues and factors
- To be able to demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.
- To enhance analytical ability of students
- To augment logical and critical thinking of Student

Unit 1 Introduction to Number System, Basic Shortcuts of addition, Multiplication, Division 6 Hours

Classification of numbers – Types of Numbers - Divisibility rules - Finding the units digit - Finding remainders in divisions involving higher powers - LCM and HCF Models - Fractions and Digits – Square, Square roots – Cube, Cube roots – Shortcuts of addition, multiplication, Division.

Unit 2 Ratio and proportion, Averages 6 Hours

Definition of Ratio - Properties of Ratios - Comparison of Ratios - Problems on Ratios - Compound Ratio - Problems on Proportion, Mean proportional and Continued Proportion Definition of Average - Rules of Average - Problems on Average - Problems on Weighted Average - Finding average using assumed mean method.

Unit 3 Percentages, Profit And Loss 6 Hours

Introduction Percentage - Converting a percentage into decimals - Converting a Decimal into a percentage - Percentage equivalent of fractions - Problems on percentages - Problems on Profit and Loss percentage- Relation between Cost Price and Selling price - Discount and Marked Price - Two different articles sold at same Cost Price - Two different articles sold at same Selling Price - Gain% / Loss% on Selling Price.

Unit 4 Coding and decoding, Direction sense 6 Hours

Coding using same set of letters - Coding using different set of letters - Coding into a number - Problems on R-model - Solving problems by drawing the paths - Finding the net distance travelled - Finding the direction - Problems on clocks - Problems on shadows - Problems on direction sense using symbols and notations.

Unit 5 Number and letter series Number and Letter Analogies, Odd man out 6 Hours

Difference series - Product series - Squares series - Cubes series - Alternate series - Combination series - Miscellaneous series - Place values of letters - Definition of Analogy - Problems on number analogy - Problems on letter analogy - Problems on verbal analogy - Problems on number Odd man out - Problems on letter Odd man out - Problems on verbal Odd man out

Total 30 Hours

COURSE OUTCOMES:

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

CO1: Learners should be able to understand number and solving problems least time using various shortcut

CO2: Solve problems on averages; compare two quantities using ratio and proportion.

CO3: Calculate concept of percentages, implement business transactions using profit and loss. CO4: Workout concepts of Coding and Decoding, ability to visualize directions and understand the logic behind a sequence.

CO5: Learners should be able to find a series the logic behind a sequence.

References:

1. Arun Sharma, 'How to Prepare for Quantitative Aptitude for the CAT', 7th edition, McGraw Hills publication, 2016.
2. Arun Sharma, 'How to Prepare for Logical Reasoning for CAT', 4th edition, McGraw Hills publication, 2017.
3. R S Agarwal, 'A modern approach to Logical reasoning', revised edition, S.Chand publication, 2017.
4. R S Agarwal, 'Quantitative Aptitude for Competitive Examinations', revised edition, S.Chand publication, 2017.
5. Rajesh Verma, "Fast Track Objective Arithmetic", 3rd edition, Arihant publication, 2018.
6. B.S. Sijwalii and Indu Sijwali, "A New Approach to REASONING Verbal & Non-Verbal", 2nd edition, Arihant publication, 2014.

LIST OF ELECTIVES

ELECTIVE I

Course Code	Course Name	L	T	P	C	Category
2003CA001	Research Methodology and IPR	3	0	0	3	PE
2003CA002	Software Quality Assurance	3	0	0	3	PE
2003CA003	Digital Image Processing	3	0	0	3	PE
2003CA004	Computer Graphics and Animation	3	0	0	3	PE
2003CA005	Software Testing	3	0	0	3	PE

LIST OF AUDIT COURSES (AC)

Registration for any of these courses is optional to students

Course Code	Course Name	L	T	P	C	Category
	English for Research Paper Writing	2	0	0	0	AC
	Disaster Management	2	0	0	0	AC
	Value Education	2	0	0	0	AC
	Constitution of India	2	0	0	0	AC

Bridge Courses

Course Name	L	T	P	C	Category	
SEMESTER II						
2001CA020	Computer Organizations and Architecture	3	0	0	3	PC
2001CA021	Operating Systems	3	0	0	3	PC
2001CA020	Database Management Systems	3	0	0	3	PC
2001CA021	Database Management System Laboratory	0	0	4	2	PC
TOTAL		9	0	4	11	