



E.G.S. PILLAY ENGINEERING COLLEGE (AUTONOMOUS)

NAGAPATTINAM – 611 002. TAMILNADU, INDIA

Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai

(Accredited by NAAC with 'A' Grade and NBA)

Email: principal@egspec.org website: www.egspec.org Ph: 04365-251112

1.1.3 Average percentage of courses having focus on employability/ entrepreneurship/ skill development offered by the institution during the last five years

2021-2022

2001CA101		L	T	P	C
	LINEAR ALGEBRA, PROBABILITY AND STATISTICS	2	2	0	3

COURSE OBJECTIVES:

1. To find the basis and dimension of vector space
2. To obtain the matrix of linear transformations and its eigenvalues and eigenvectors
3. To provide foundation on Applied probability
4. To use various statistical techniques in Application Problems
5. To introduce the concept of Design of Experiments for data analysis

UNIT I VECTOR SPACES 12 Hours

Real and Complex fields - Vector spaces over Real and Complex fields - Sub space - Linear space - Linear independence and dependence - Basis and dimension.

UNIT II LINEAR TRANSFORMATION 12 Hours

Linear transformation - Rank space and null space - Rank and nullity - Dimension theorem - Matrix representation of linear transformation - Eigenvalues and Eigenvectors of linear transformation.

UNIT III PROBABILITY AND RANDOM VARIABLES 12 Hours

Probability - Axioms of Probability - Conditional Probability - Addition and multiplication laws of Probability - Baye's theorem - Random Variables - Discrete and continuous random variables - Probability mass function and Probability density functions - Cumulative distribution function - Moments and variance of random variables - Properties - Binomial, Poisson, Geometric, Uniform, Exponential, Normal distributions and their properties.

UNIT IV TESTING OF HYPOTHESIS 12 Hours

Sampling distributions - Tests based on small and large samples - Normal, Student's t, Chi-square and F distributions for testing of mean, variance and proportion and testing of difference of means variances and proportions - Tests for independence of attributes and goodness of fit.

UNIT V DESIGN OF EXPERIMENTS 12 Hours

Analysis of variance - Completely randomized design - Random block design (One-way and Twoway classifications) - Latin square design - 2^2 Factorial design.

TOTAL: 60 HOURS

COURSE OUTCOMES:

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

- CO1: Test the consistency and solve system of linear equations.
- CO2: Find the basis and dimension of vector space.
- CO3: Apply the Probability axioms as well as rules and the distribution of discrete and continuous also the random variable ideas in solving real world problems.
- CO4: Use statistical techniques in testing hypothesis on data analysis.
- CO5: Use the appropriate statistical technique of design of experiments in data analysis.

REFERENCES:

1. Friedberg A.H, Insel A.J. and Spence L, Linear Algebra, Prentice Hall of India, New Delhi,



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2004.

2. Faires J.D. and Burden R., Numerical Methods, Brooks/Cole (Thomson Publications), New Delhi, 2002.
3. Devore, J.L., Probability and Statistics for Engineering and Sciences, Cengage Learning, Eighth Edition, New Delhi, 2014.
4. I. Miller and M. Miller, Mathematical Statistics, Pearson Education Inc., Asia Seventh Edition, New Delhi, 2011.
5. Richard Johnson, Miller and Freund's Probability and Statistics for Engineer, Prentice Hall of India Private Ltd., Eighth Edition, New Delhi, 2011.
6. <https://nptel.ac.in/>

2002CA102	ADVANCED DATA STRUCTURES AND ALGORITHMS	L	T	P	C
		3	0	0	3

PREREQUISITE :

Problem Solving And Programming

COURSE OBJECTIVES:

1. To understand the linear and non linear data structures available in solving problems
2. To know about the sorting and searching techniques and its efficiencies
3. Using the Graph data structures and algorithms in real time applications
4. To use algorithm design paradigms for algorithm design

UNIT I LINEAR DATA STRUCTURES

9 Hours

Introduction – Arrays – Structures- Abstract Data Types (ADT)- Stack- Representing Stacks- Applications of stack – Infix to postfix conversion – evaluation of expression- Queue- Representing Queue- Applications of Queue- Linked Lists –singly Linked list- Doubly Linked lists.

UNIT II TREE STRUCTURES

9 Hours

Binary Trees – Operations on Binary trees – Binary Tree Representations – Node representation – Internal and External nodes- Binary tree Traversals - Binary search tree -Huffman Algorithm-

UNIT III BALANCED SEARCH TREES, SORTING AND INDEXING

9 Hours

Red-Black trees –B-Trees - Sorting – Bubble sort - Quick Sort - Insertion Sort – Heap sort – Hashing - Hashing functions - Collision Resolution Techniques - Separate chaining - Open addressing - Multiple Hashing.

UNIT IV GRAPHS

9 Hours

Definitions – Representation of graph - Graph Traversals - Depth-first traversal – breadth-first traversal - applications of graphs - Topological sort – shortest-path algorithms – minimum spanning tree – Prim's and Kruskal's algorithms – Single Source Shortest Path -Dijkstra's Algorithm -biconnectivity – Euler circuits.

UNIT V ALGORITHM DESIGN AND ANALYSIS

9 Hours

Algorithm Analysis – Asymptotic Notations - Divide and Conquer – Merge Sort – Binary Search - Greedy Algorithms – Activity Selection Problem – Dynamic Programming – Matrix Chain Multiplication – Longest Common Subsequence- Backtracking – Sum of Subset Problem-NP Problems -Polynomial Time – Polynomial-time Verification -Vertex Cover Problem-Clique .

TOTAL: 45 HOURS

FURTHER READING:

Geometric Algorithms

COURSE OUTCOMES:

- On the successful completion of the course, students will be able to
- CO1: To select and apply the data structure to suit any given problem
 - CO2: Design and Implement Tree data structures and Sets



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- CO3: Implement a variety of algorithms for sorting
- CO4: To apply the algorithm design techniques to any of the real world problem.
- CO5: Design algorithms using dynamic programming and Greedy approaches and graph structure to solve real-life problems.
- CO6: Analyze problems in terms of polynomial time.

REFERENCES:

1. Y. Langsam, M. J. Augenstein and A. M. Tenenbaum, "Data Structures using C", Pearson Education Asia, 2004.
2. T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, "Introduction to algorithms", Second Edition
3. Anany Levitin "Introduction to the Design and Analysis of Algorithms" Pearson Education 2003.
4. M. A. Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education Asia, 2013.
5. https://www.tutorialspoint.com/data_structures_algorithms/algorithms_basics.htm

		L	T	P	C
2002CA103	COMPUTER COMMUNICATIONS AND NETWORKS	3	0	0	3
PREREQUISITE:		Computer Organization and Architecture			
COURSE OBJECTIVES:					
1. To explore various data communication techniques.					
2. To know network fundamentals and protocols.					
3. To understand network addressing and routing concepts.					
4. To understand the requirements of reliable and unreliable communication					
5. To understand the functionality and concepts of various application layer protocols					
UNIT I	DATA COMMUNICATIONS	08 Hours			
Data communications and Networking: Communication model, Data transmission concepts and terminology, Transmission media, Data encoding techniques - Digital data communication techniques: Error detection and Statistical/TDM.					
UNIT II	NETWORK FUNDAMENTALS	08 Hours			
Data link communication: network interface layer: Framing - Reliable transmission: stop and wait protocol, sliding window protocols.					
UNIT III	DATA LINK LAYER	10 Hours			
Data link communication: error control and Error Correction - MAC - Ethernet, Token ring, Wireless LAN MAC - Blue Tooth - Bridges - Spanning Tree Algorithm.					
UNIT IV	NETWORK LAYER	09 Hours			
Network layer functions - circuit switching - packet switching - IP datagram - IPv4 - Sub netting and classless addressing - IPv6 - ARP - Routing protocols: distance vector, link state - ICMP - ICMPv6 - Case study on Network Design.					
UNIT V	TRANSPORT LAYER AND APPLICATION LAYER	10 Hours			
Transport Layer: Duties of transport layer - User Datagram Protocol - Transmission Control Protocol - Congestion control: Application Layer: Application layer Protocols - World Wide Web and HTTP - FTP - Domain name system: Telnet - Electronic mail protocols - SNMP - Case study on Software Defined Networks.					
FURTHER READING:		TOTAL: 43 HOURS			
Network Simulation 3 Tool					
COURSE OUTCOMES:					
On the successful completion of the course, students will be able to					
CO1	Analyze the Communication Model and Data encoding techniques used in Computer Communications				
CO2	Create simple networks by applying networking Protocols				
CO3	Establish Data communication layer in simple networks using Data Link Protocols.				
CO4	Configure IP addresses using classes of IP and create subnets				
CO5	Establish Transport layer and application layer in simple networks using protocols				
REFERENCES:					
1. Larry L. Peterson and Bruce S. Davie, "Computer Networks: A Systems Approach", Fifth Edition, Morgan Kaufmann Publishers, 2012.					
2. William Stallings, "Data and Computer Communications", Tenth Edition, Pearson, 2013					
3. James F. Kurose, Keith W. Ross, "Computer Networking: A Top-Down Approach", Fifth Edition, Pearson Education, 2012.					
4. Forouzan, "Data Communication and Networking", Fifth Edition, TMH, 2012.					

2004CA109 Subject Name: Verbal Ability

L T P C
0 0 2 1

Course Objectives:

1. To help students comprehend and use vocabulary words in their day to day communication.



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2. To apply appropriate reading strategies for interpreting technical and non-technical documents used in job-related settings.
3. To ensure students will be able to use targeted grammatical structures meaningfully and appropriately in oral and written production.
4. To enable the students to arrange the sentences in meaningful unit and to determine whether constructions rely on active or passive voice
5. To Apply the principles of effective business writing to hone communication skills
6. To apply the principles of business etiquettes and Market surveying.

Unit 1	VOCABULARY USAGE	6 hours
Introduction - Synonyms and Antonyms based on Technical terms – Single word Substitution – Newspaper, Audio and video listening activity.		
Unit 2	COMPREHENSION ABILITY	6 hours
Skimming and Scanning – Social Science passages – Business and Economics passages – latest political and current event based passages – Theme detection – Deriving conclusion from passages		
Unit 3	BASIC GRAMMAR AND ERROR DETECTION	6 hours
Parallelism – Redundancy – Ambiguity – Concord - Common Errors – Spotting Errors – Sentence improvement – Error Detection FAQ in Competitive exams.		
Unit 4	REARRANGEMENT AND GENERAL USAGE	6 hours
Jumble Sentences – Cloze Test - Idioms and Phrases – Active and passive voice – Spelling test.		
Unit 5	APPLICATION OF VERBAL ABILITY	6 hours
Business Writing - Business Vocabulary - Delivering Good / Bad News - Media Communication - Email Etiquette – Report Writing - Proposal writing – Essay writing– Indexing –Market surveying.		

Course Outcomes:

After the completion of this course, the Students will be able to,

1.	Construct new words in their day to day communication.	K2
2.	Predict the information swiftly while reading passages.	K2
3.	Elaborate their oral and written communication.	K2
4.	Rephrase the sentences and able to identify the voice of the sentence.	K2
5.	Summarize their knowledge of the best practices to craft effective business documents	K2



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6.	Make use of the etiquettes in business.	K3
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REFERENCES

1. Arun Sharma and Meenakshi Upadhyav, How to Prepare for Verbal Ability and Reading Comprehension for CAT, McGrawHill Publication, Seventh Edition 2017
2. R S Aggarwal and Vikas Aggarwal , Quick Learning Objective General English ,S.Chand Publishing House, 2017
3. Dr.K.Alex , Soft Skills, S.Chand Publishing House, Third Revise Edition, 2014
4. Raymond Murphy, Essential English Grammar in Use, Cambridge University press, New Delhi, Third Edition , 2007

ASSESSMENT PATTERN :

Two tests will be conducted (25 * 2) - 50 marks

five assignments will be conducted (5*10) - 50 Marks

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.		



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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.



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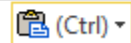
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2002CA104		ADVANCED DATABASES		L	T	P	C
PREREQUISITE:				3	0	0	3
		1. Basic Data Structures					
		2. Database management system					
COURSE OBJECTIVES:							
		1. To learn the fundamentals of Parallel and Distributed Databases					
		2. To make a study on Object Oriented Databases					
		3. To explore the concepts of XML Databases and Mobile Databases					
		4. To gain knowledge on the intelligent Databases.					
UNIT I	PARALLEL AND DISTRIBUTED DATABASES			09 Hours			
		Database System Architectures: Centralized and Client-Server Architectures - Server System Architectures - Parallel Systems- Distributed Systems - Parallel Databases- IO Parallelism - Inter and Intra Query Parallelism - Inter and Intra operation Parallelism - Distributed Database Concepts - Distributed Data Storage - Distributed Transactions - Commit Protocols - Server Architectures- Case Studies.					
UNIT II	OBJECT AND OBJECT RELATIONAL DATABASES			09 Hours			
		Concepts - Object Databases - Object Oriented Database Architectures - Constructors - Encapsulation of Operations - Methods - Persistence - Type and Class Hierarchies - Inheritance - Complex Objects - Object Database Standards, Languages and Design: ODMG Model - ODL - OQL - Object Relational and Extended - Relational Systems - Object Relational features in SQL / Oracle - Case Studies.					
UNIT III	XML DATABASES			09 Hours			
		XML Databases- XML Data Model - DTD - XML Schema - XML Querying - Web Databases - JDBC - Information Retrieval - Data Warehousing - Data Mining.					
UNIT IV	MOBILE DATABASES			09 Hours			
		Mobile Databases: Location and Handoff Management - Effect of Mobility on Data Management - Location - Dependent Data Distribution - Mobile Transaction Models - Concurrency Control - Transaction Commit Protocols- Mobile Database Recovery: Schemes.					
UNIT V	INTELLIGENT DATABASES			09 Hours			
		Active databases - Deductive Databases - Knowledge bases - Multimedia Databases- Multidimensional Data Structures - Image Databases - Text/Document Databases- Video Databases- Audio Databases - Multimedia Database Design - Spatial Databases.					
				TOTAL: 45 HOURS			
FURTHER READING:							
		Data mining and Warehousing, Big Data					
COURSE OUTCOMES:							
		On the successful completion of the course, students will be able to					
		CO1: Develop transaction processing systems with concurrency control.					
		CO2: Design Object oriented databases for real time applications.					
		CO3: Develop XML databases for web applications.					
		CO4: Design Mobile databases for mobile devices.					
		CO5: Apply intelligent/real in database development.					
REFERENCES:							
		1. Henry F Korth, Abraham Abraham and S. Abraham, "Database System Concepts", Sixth Edition, McGraw Hill, 2011.					
		2. C.J.Data, A.Kannan, S.Srinivasan, "An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006.					
		3. K. Elmasri, S.S. Navathe, "Fundamentals of Database Systems", Fifth Edition, Pearson Education/Addison Wesley, 2007.					
		4. Thomas Connolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education, 2007.					
		5. Shirley Chandrasekaran , "Multimedia Databases", Morgan Kaufman Publishers, 2003.					
		6. Frank F. Coyler, "XML, Web Services and The Data Revolution", Pearson Education, 2012.					
		7. http://www.geeksforgeeks.org/introduction-of-dms-database-management-system-act-1/					
		8. http://www.javatpoint.com/dms-tutorial					
		9. http://www.tutorialspoint.com/dms/index.htm					





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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/Rmapping – 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.



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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, Converter, 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)



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- 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. KavehPahlavan, PrasanthKrishnamoorthy, "Principles of Wireless Networks", Pearson Education, 2003.
2. UweHansmann, LotharMerk, 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



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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 –RapidMiner-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..
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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



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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 IoTARCHITECTURE

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 StorageModels & 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.



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- Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), "Architecting the Internet of Things", Springer, 2011.
- Honbo Zhou, "The Internet of Things in the Cloud: A Middleware Perspective", CRC Press, 2012.
- Olivier Hersent, David Boswarthick, Omar Elloumi, "The Internet of Things – Key applications and Protocols", Wiley, 2012.
- ManoelCarlosRamon, "Intel@Galileo and Intel@GalileoGen2:API Features and ArduinoProjectsfor Linux Programmers", Apress, 2014.
- MarcoSchwartz, "Internetof Things with the ArduinoYun", PacktPublishing, 2014.
- "Internet of Things: Science Fiction or Business Fact?" (PDF). *Harvard Business Review*. November 2014. Retrieved 23 October 2016.
- 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"
- https://www.tutorialspoint.com/internet_of_things/
- <https://www.edureka.co/blog/iot-tutorial/>

2002CA105	PYTHON PROGRAMMING	L	T	P	C
		3	0	0	3

PREREQUISITE :

- Objected Oriented Programming
- Advanced Java Programming

COURSE OBJECTIVES:

- To introduce the basics of Python .
- To implement python programs with conditionals and loops
- Demonstrate the use of Python lists and dictionaries
- Describe and apply object-oriented programming methodology

UNIT I INTRODUCTION PYTHON 9 Hours

Introduction –Python –Interpreter-keywords and identifier-Data types-Variables-operators-Expression-Comments- list—statements-tuple assignment- operators-module--illustrative programs..

UNIT II CONTROL FLOW AND FUNCTION 9 Hours

Conditionals- Boolean values and operators- conditional (if)-alternative (if-else),-chained conditional (if-elif-else);-Iteration: state-while-for-break- continue- pass- functions- return values-parameters-local and global scope-function composition- recursion-Strings-string slices- immutability- string functions and methods-string module- Lists as arrays.

UNIT III LISTS,TUPLES,DICTIONARIES 9 Hours

Lists: list operations-list slices- list methods-list loop- mutability-aliasing-cloning lists-list parameters-Tuples: tuple assignment- tuple as return valued-Dictionaries-operations and methods-advanced list processing - list comprehension- **Illustrative programs-selection sort- insertion sort,-Mergesort-histogram.**

UNIT IV NumPy 9 Hours

NumPy- NumPy Array-NumPy Side Effects-SubsettingNumPy Arrays-2D NumPy Arrays-2D Arithmetic - Basic Statistics

UNIT V FILES,MODULES AND PACKAGES 9 Hours

Files and exception-text files- reading and writing files-format operator-command line arguments-errors and exceptions-handling modules-packages- Represent compound data using Python lists, tuples, dictionaries - word count- copy file.

TOTAL: 45 HOURS

FURTHER READING:

- Intermediate Python Resources



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COURSE OUTCOMES:

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

- CO1: Describe the basics of python programming
- CO2: Develop the python programs using Conditional Statements.
- CO3: Develop the python program using Lists, Tuples, Dictionaries
- CO4: Develop the real time application using NumPy array concepts,
- CO5: Develop the python programs using files and packages.

REFERENCES:

1. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist``, 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016
2. Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.
3. John V Guttag, —Introduction to Computation and Programming Using Python``, Revised and expanded Edition, MIT Press , 2013
4. Robert Sedgewick, Kevin Wayne, Robert Dondero, —Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
5. Timothy A. Budd, —Exploring Python!, Mc-Graw Hill Education (India) Private Ltd.,, 2015.



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PROJECT WORK

Duration: 6 Months internal/external project work with submission of project work and viva-voce examination

Objectives:

- To practically explore and implement the concepts learned in Curriculum in real environment.

Students are expected to take up problems in their relevant industry and implement an IT based solution for the problem, based on the curriculum they studied. The domains of the problems may reach out to various industrial and academic sectors. The evaluation of the project would be based on the usefulness of the problem statement, formulation of the problem, stakeholders need, and the usage statistics of the solution and the technical merit of the solution.

The project design, development and testing phases may be as per the following:

REQUIREMENTS ENGINEERING PHASE:

- Problem identification.
- Feasibility study of domain.
- Requirement elicitation and analysis.

DESIGN PHASE:

- Architectural design.
- UI design.
- Component Design.
- Database design.

IMPLEMENTATION PHASE:

- Coding in a suitable language using necessary platforms and tools.

TESTING AND VALIDATION PHASE:

- Component Testing.
- System Testing.
- Acceptance Testing.

Course Outcome:

Upon completion of the Project Work the Students will be able to

1. Implement the solution for the chosen problem using the concepts and techniques in the curriculum.
2. Record the research development process of a particular problem



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2020-2021

		L	T	P	C
2002CA301	CRYPTOGRAPHY AND NETWORK SECURITY	2	0	2	3
PREREQUISITE :					
Data Communications and Network Security					
COURSE OBJECTIVES:					
1. To understand the basics of cryptography					
2. To learn to find the vulnerabilities in programs and to overcome them					
3. To know the different kinds of security threats in networks and its solution					
4. To know the different kinds of security threats in databases and solutions available					
5. To learn about the models and standards for security.					
UNIT I	ELEMENTARY CRYPTOGRAPHY	12 Hours			
Terminology and Background – Substitution Ciphers – Transpositions – Making Good Encryption Algorithms- Data Encryption Standard- AES Encryption Algorithm – Public Key Encryption –Cryptographic Hash Functions – Key Exchange – Digital Signatures – Certificates					
UNIT II	PROGRAM SECURITY	12 Hours			
course programs – open-source program errors – viruses – targeted malicious code – controls Against Program Practices – Open Web Application Security Project Flaws – Common Weakness Enumeration Most Dangerous Software Errors					
UNIT III	SECURITY IN NETWORKS	12 Hours			
Threats in networks – Encryption – Virtual Private Networks – PKI – SSH – SSL – WPA – Content Integrity – Access Controls – Wireless Security – Honeynets – Traffic Flow Security – Firewalls –Intrusion Detection Systems – Secure e-mail.					
UNIT IV	SECURITY IN DATABASES	12 Hours			
Security requirements of database systems – Reliability and Integrity in databases –Redundancy –Recovery – Concurrency/ Consistency – Monitors – Sensitive Data – Types of disclosures – Inference-finding and confirming sql injection					
UNIT V	SECURITY MODELS AND STANDARDS	12 Hours			
Secure SDLC – Secure Application Testing – Security architecture models – Trusted Computing Base– Bell-LaPadula Confidentiality Model – Biba Integrity Model – Graham-Denning Access Control Model – Harrison-Ruzzo-Thomas Model – Secure Frameworks – COSO – Cobit – Compliances – PCI DSS – Security Standards – ISO 27000 family of standards – NIST.					
TOTAL: 60 HOURS					
FURTHER READING:					
1. Challenge –Hatchback Authentication Protocol (CHAP)					
COURSE OUTCOMES:					
On the successful completion of the course, students will be able to					
CO1: Apply cryptographic algorithms for encrypting and decryption for secure data transmission					
CO2: Understand the importance of Digital signature for secure e-documents exchange					
CO3: Understand the program threats and apply good programming practice					
CO4: Get the knowledge about the security services available for internet and web applications					
CO5: Gain the knowledge of security models and published standards					
REFERENCES:					
1. Charles F. Morgan, Shan Lawrence Morgan, "Security in Computing", Fourth Edition, Pearson Education, 2007					
2. William Stallings, "Cryptography and Network Security, Principles and Practices", Fifth Edition, Prentice Hall, 2010.					
3. Michael Howard, David LeBlanc, John Vega, "14 Deadly Sins of Software Security: Programming Flaws and How to Fix Them", First Edition, McGraw-Hill Osborne Media, 2009.					
4. Michael Whitman, Herbert J. Mattord, "Management of Information Security", Third Edition,					



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2002CA303

HUMAN RESOURCES MANAGEMENT

L	T	P	C
3	0	0	3

PREREQUISITE:

1. Software Quality Management
2. Software Project Management

COURSE OBJECTIVES:

1. To enable the students to understand the various HR functions in-depth.
2. To familiarize students with contemporary practices.
3. To enable the students to understand the challenges in domestic and HRM

UNIT I PERSPECTIVES IN HUMAN RESOURCE MANAGEMENT 08 Hours

Evolution of human resource management – The importance of the human factor – Challenges – HR functions - Role of human resource manager – **Human resource policies** – Computer applications in human resource management – Human resource accounting and audit – environment of HRM.

UNIT II THE **CONCEPT OF BEST FIT EMPLOYEE** 08 Hours

Importance of Human Resource Planning – Forecasting human resource requirement – matching supply and demand - Internal and External sources. Recruitment - Selection – induction – Socialization benefits.

UNIT III **TRAINING AND EXECUTIVE DEVELOPMENT** 10 Hours

Types of training methods – purpose- benefits- resistance. Executive Development Programme – Common practices - Benefits – Self development – Knowledge management.

UNIT IV SUSTAINING EMPLOYEE INTEREST 09 Hours

Compensation plan – Reward, remuneration, incentives and benefits – Career management – Development of mentor – Protégé relationships.

UNIT V **PERFORMANCE EVALUATION AND IHRM** 10 Hours

Method of performance evaluation – Feedback – Promotion – Demotion – Transfer and Separation – Implication of job change - The control process – Importance – Methods – grievances – Causes – Implications – Redressal methods.

TOTAL: 45 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

1. HRIS, Social networking, e-learning, Recent trends in compensation
2. Changing roles of HR during the transition from Local to Global

COURSE OUTCOMES:

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

- CO1: Explain the importance of human resource and their effective management in organization.
- CO2: Describe the procedures and practices using recruitment and selection
- CO3: Summarize how to implement the successful training program using types of training methods.
- CO4: Classify the employee benefit packages with compensation plans.
- CO5: Associate the activities involved in Performance Appraisal by discussing challenges and implications in grievance redressal methods.

REFERENCES:



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2. Dessler&Varkkey, Human Resource Management, 14th edition, Pearson Education Limited,2016
3. K.Aswathappa, Human Resource and Personnel Management- Text & Cases, Tata McGraw Hill,2013
4. LuisR.Gomez-Mejia,DavidB.Balkin,RobertLCardy.ManagingHumanResource.PHILearning, 2012
5. Ivancevich, Human Resource Management, McGraw Hill2012
6. Bernadin , Human Resource Management ,Tata McGraw Hill ,8th edition2012
7. Uday Kumar Haldar, JuthikaSarkar. Human Resource management. Oxford.2012.
8. Decenzo and Robbins, Human Resource Management, Wiley, 8th Edition, 2007.
9. BiswajeetPattanayak, Human Resource Management, PHI, Third Edition, 2005
10. Dr.V.P.Michael, Human Resource Management & Human Relations, Himalaya Publishing House, 2005
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