

MOHAMED SATHAK A J COLLEGE OF ENGINEERING

Sponsored by Mohamed Sathak Trust
(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)
Siruseri IT Park, Egattur, Chennai 603 103

B.TECH – INFORMATION TECHNOLOGY

S.NO	Name of the course that include experiential learning through Project work/ Internship
1	CS6202- Programming and Data Structures I
2	CS6301- Programming and Data Structures II
3	CS6001- C# and .NET Programming
4	CS6703- Grid and Cloud Computing
5	IT6601- Mobile Computing
6	CS6551- Computer Networks
7	CS6659 - Artificial Intelligence
8	CS6701 - Cryptography and Network Security
9	IT6702- Data warehousing and Data mining
10	IT6503- Web Programming
11	CS6008 - Human Computer Interaction
12	IT6701 - Information Management
13	IT6004 -Software Testing
14	IT6801- Service Oriented Architecture
15	CS6304 – Analog and Digital Communication
16	CS6302- Database Management Systems
17	CS6402- Design and Analysis of Algorithms
18	CS6003- Ad hoc and Sensor Networks



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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
1	CS6202	PROGRAMMING AND DATA STRUCTURES I	<ul style="list-style-type: none">• Applications of Lists.• Queue ADT• Hash Functions• Open Addressing

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OBJECTIVES:

The student should be made to:

- Be familiar with the basics of C programming language.
- Be exposed to the concepts of ADTs
- Learn linear data structures - list, stack, and queue.
- Be exposed to sorting, searching, hashing algorithms

UNIT I C PROGRAMMING FUNDAMENTALS- A REVIEW 9
 Conditional statements - Control statements - Functions - Arrays - Preprocessor - Pointers -
 Variation in pointer declarations - Function Pointers - Function with Variable number of arguments

UNIT II C PROGRAMMING ADVANCED FEATURES 9
 Structures and Unions - File handling concepts - File read - write - binary and Stdio - File
 Manipulations

UNIT III LINEAR DATA STRUCTURES – LIST 9
 Abstract Data Types (ADTs) - List ADT - array-based implementation - linked list implementation –
 singly linked lists- circularly linked lists- doubly-linked lists - applications of lists -Polynomial
 Manipulation - All operation (Insertion, Deletion, Merge, Traversal)

UNIT IV LINEAR DATA STRUCTURES – STACKS, QUEUES 9
 Stack ADT - Evaluating arithmetic expressions- other applications- Queue ADT - circular queue
 implementation - Double ended Queues - applications of queues

UNIT V SORTING, SEARCHING AND HASH TECHNIQUES 9
 Sorting algorithms: Insertion sort - Selection sort - Shell sort - Bubble sort - Quick sort - Merge sort -
 Radix sort - Searching: Linear search -Binary Search Hashing: Hash Functions - Separate
 Chaining - Open Addressing - Rehashing - Extendible Hashing.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Use the control structures of C appropriately for problems.
- Implement abstract data types for linear data structures.
- Apply the different linear data structures to problem solutions.
- Critically analyse the various algorithms.

TEXT BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, "The C Programming Language", 2nd Edition, Pearson Education, 1988.
2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education, 1997.

REFERENCES:

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms", Second Edition, Mcgraw Hill, 2002.
2. Reema Thareja, "Data Structures Using C", Oxford University Press, 2011
3. Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education, 1983.
4. Stephen G. Kochan, "Programming in C", 3rd edition, Pearson Ed.,

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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
2	CS6301	PROGRAMMING AND DATA STRUCTURES II	<ul style="list-style-type: none">• Data Abstraction• Encapsulation• Function Overloading• Operators Overloading• Splay Trees• Binomial Heaps• Shortest Path Algorithm• Ford Algorithm• Floyd Algorithm

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OBJECTIVES:

The student should be made to:

- Be familiar with the C++ concepts of abstraction, encapsulation, constructor, polymorphism, overloading and Inheritance.
- Learn advanced nonlinear data structures.
- Be exposed to graph algorithms
- Learn to apply Tree and Graph structures

UNIT I OBJECT ORIENTED PROGRAMMING FUNDAMENTALS 9

C++ Programming features - Data Abstraction - Encapsulation - class - object - constructors - static members - constant members - member functions - pointers - references - Role of this pointer - Storage classes - function as arguments.

UNIT II OBJECT ORIENTED PROGRAMMING CONCEPTS 9

String Handling - Copy Constructor - Polymorphism - compile time and run time polymorphisms - function overloading - operators overloading - dynamic memory allocation - Nested classes - Inheritance - virtual functions.

UNIT III C++ PROGRAMMING ADVANCED FEATURES 9

Abstract class - Exception handling - Standard libraries - Generic Programming - templates - class template - function template - STL - containers - iterators - function adaptors - allocators - Parameterizing the class - File handling concepts.

UNIT IV ADVANCED NON-LINEAR DATA STRUCTURES 9

AVL trees - B-Trees - Red-Black trees - Splay trees - Binomial Heaps - Fibonacci Heaps - Disjoint Sets - Amortized Analysis - accounting method - potential method - aggregate analysis.

UNIT V GRAPHS 9

Representation of Graphs - Breadth-first search - Depth-first search - Topological sort - Minimum Spanning Trees - Kruskal and Prim algorithm - Shortest path algorithm - Dijkstra's algorithm - Bellman-Ford algorithm - Floyd - Warshall algorithm.

TOTAL: 45 PERIODS**OUTCOMES:**

At the end of the course, the student should be able to:

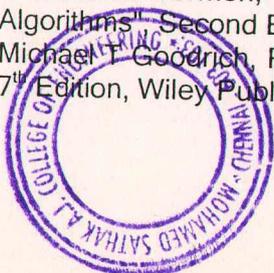
- Design problem solutions using Object Oriented Techniques.
- Apply the concepts of data abstraction, encapsulation and inheritance for problem solutions.
- Use the control structures of C++ appropriately.
- Critically analyse the various algorithms.
- Apply the different data structures to problem solutions.

TEXT BOOKS:

1. Bjarne Stroustrup, "The C++ Programming Language", 3rd Edition, Pearson Education, 2007.
2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", 2nd Edition, Pearson Education, 2005

REFERENCES:

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Second Edition, Mc Graw Hill, 2002.
2. Michael T. Goodrich, Roberto Tamassia, David Mount, "Data Structures and Algorithms in C++", 7th Edition, Wiley Publishers, 2004.



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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
3	CS6001	C# and .NET PROGRAMMING	<ul style="list-style-type: none">• Arrays, Array class, Array list, String, String Builder• Interface, Abstract class, abstract and Interface• SQL Server with ADO.NET• XML and .NET• Returning exceptions from SQL Server

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OBJECTIVES:

The student should be made to:

- Understand the foundations of CLR execution.
- Learn the technologies of the .NET framework.
- Know the object oriented aspects of C#.
- Be aware of application development in .NET.
- Learn web based applications on .NET (ASP.NET).

UNIT I INTRODUCTION TO C#

9

Introducing C#, Understanding .NET, overview of C#, Literals, Variables, Data Types, Operators, checked and unchecked operators, Expressions, Branching, Looping, Methods, implicit and explicit casting, Constant, Arrays, Array Class, Array List, String, String Builder, Structure, Enumerations, boxing and unboxing.

UNIT II OBJECT ORIENTED ASPECTS OF C#

9

Class, Objects, Constructors and its types, inheritance, properties, indexers, index overloading, polymorphism, sealed class and methods, interface, abstract class, abstract and interface, operator overloading, delegates, events, errors and exception, Threading.

UNIT III APPLICATION DEVELOPMENT ON .NET

9

Building windows application, Creating our own window forms with events and controls, menu creation, inheriting window forms, SDI and MDI application, Dialog Box (Modal and Modeless), accessing data with ADO.NET, DataSet, typed dataset, Data Adapter, updating database using stored procedures, SQL Server with ADO.NET, handling exceptions, validating controls, windows application configuration.

UNIT IV WEB BASED APPLICATION DEVELOPMENT ON .NET

9

Programming web application with web forms, ASP.NET introduction, working with XML and .NET, Creating Virtual Directory and Web Application, session management techniques, web.config, web services, passing datasets, returning datasets from web services, handling transaction, handling exceptions, returning exceptions from SQL Server.

UNIT V CLR AND .NET FRAMEWORK

9

Assemblies, Versioning, Attributes, reflection, viewing meta data, type discovery, reflection on type, marshalling, remoting, security in .NET

TOTAL: 45 PERIODS**OUTCOMES:**

After completing this course, the student will be able to:

- List the major elements of the .NET framework
- Explain how C# fits into the .NET platform.
- Analyze the basic structure of a C# application
- Debug, compile, and run a simple application.
- Develop programs using C# on .NET
- Design and develop Web based applications on .NET
- Discuss CLR.


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TEXT BOOKS:

1. Herbert Schildt, "The Complete Reference: C# 4.0", Tata Mc Graw Hill, 2012.
2. Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012.



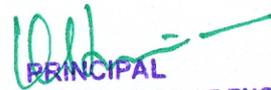


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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
4	CS6703	GRID AND CLOUD COMPUTING	<ul style="list-style-type: none">• Service Oriented Architecture• Open Grid Services Architecture(OGSA)• OGSA Services• Virtualization of CPU, Memory and I/O Devices• Cloud Infrastructure Security. Network, host and application level• Saas, Paas, Iaas


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OBJECTIVES:

The student should be made to:

- Understand how Grid computing helps in solving large scale scientific problems.
- Gain knowledge on the concept of virtualization that is fundamental to cloud computing.
- Learn how to program the grid and the cloud.
- Understand the security issues in the grid and the cloud environment.

UNIT I INTRODUCTION

9

Evolution of Distributed computing: Scalable computing over the Internet - Technologies for network based systems - clusters of cooperative computers - Grid computing Infrastructures - cloud computing - service oriented architecture - Introduction to Grid Architecture and standards - Elements of Grid - Overview of Grid Architecture.

UNIT II GRID SERVICES

9

Introduction to Open Grid Services Architecture (OGSA) - Motivation - Functionality Requirements - Practical & Detailed view of OGSA/OGSI - Data intensive grid service models - OGSA services.

UNIT III VIRTUALIZATION

9

Cloud deployment models: public, private, hybrid, community - Categories of cloud computing: Everything as a service: Infrastructure, platform, software - Pros and Cons of cloud computing - Implementation levels of virtualization - virtualization structure - virtualization of CPU, Memory and I/O devices - virtual clusters and Resource Management - Virtualization for data center automation.

UNIT IV PROGRAMMING MODEL

9

Open source grid middleware packages - Globus Toolkit (GT4) Architecture , Configuration - Usage of Globus - Main components and Programming model - Introduction to Hadoop Framework - Mapreduce, Input splitting, map and reduce functions, specifying input and output parameters, configuring and running a job - Design of Hadoop file system, HDFS concepts, command line and java interface, dataflow of File read & File write.

UNIT V SECURITY

9

Trust models for Grid security environment - Authentication and Authorization methods - Grid security infrastructure - Cloud Infrastructure security: network, host and application level - aspects of data security, provider data and its security, Identity and access management architecture, IAM practices in the cloud, SaaS, PaaS, IaaS availability in the cloud, Key privacy issues in the cloud.

TOTAL: 45 PERIODS**OUTCOMES:**

At the end of the course, the student should be able to:

- Apply grid computing techniques to solve large scale scientific problems.
- Apply the concept of virtualization.
- Use the grid and cloud tool kits.
- Apply the security models in the grid and the cloud environment.

TEXT BOOK:

1. Kai Hwang, Geoffery C. Fox and Jack J. Dongarra, "Distributed and Cloud Computing: Clusters, Grids, Clouds and the Future of Internet", First Edition, Morgan Kaufman Publisher, an Imprint of Elsevier, 2012.



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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
5	IT6601	MOBILE COMPUTING	<ul style="list-style-type: none">• Mobile Computing Applications• Overview of TCP/IP• Global system for mobile communication (GSM)• Adhoc basic concepts• MANET VS VANET Security• IOS, ANDROID.


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IT6601

MOBILE COMPUTING

LT PC 3003

OBJECTIVES:

The student should be made to:

- Understand the basic concepts of mobile computing.
- Be familiar with the network protocol stack.
- Learn the basics of mobile telecommunication system.
- Be exposed to Ad-Hoc networks.
- Gain knowledge about different mobile platforms and application development.

UNIT I INTRODUCTION

Mobile Computing – Mobile Computing Vs wireless Networking – Mobile Computing Applications – Characteristics of Mobile computing – Structure of Mobile Computing Application. MAC Protocols – Wireless MAC Issues – Fixed Assignment Schemes – Random Assignment Schemes – Reservation Based Schemes.

9

UNIT II MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER

Overview of Mobile IP – Features of Mobile IP – Key Mechanism in Mobile IP – route Optimization. Overview of TCP/IP – Architecture of TCP/IP- Adaptation of tCP Window – Improvement in TCP Performance.

9

UNIT III MOBILE TELECOMMUNICATION SYSTEM

Global System for Mobile Communication (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Telecommunication System (UMTS).

9

UNIT IV MOBILE AD-HOC NETWORKS

Ad-Hoc Basic Concepts – Characteristics – Applications – Design Issues – Routing – Essential of Traditional Routing Protocols – Popular Routing Protocols – Vehicular Ad Hoc networks (VANET) – MANET Vs VANET – Security.

9

UNIT V MOBILE PLATFORMS AND APPLICATIONS

Mobile Device Operating Systems – Special Constrains & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry, Windows Phone – M- Commerce – Structure – Pros & Cons – Mobile Payment System – Security Issues.

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TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

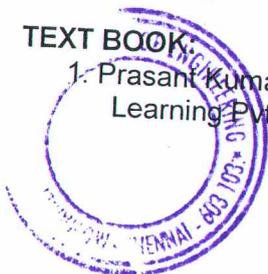
- Explain the basics of mobile telecommunication system
- Choose the required functionality at each layer for given application
- Identify solution for each functionality at each layer
- Use simulator tools and design Ad hoc networks
- Develop a mobile application.

TEXT BOOK

1. Prasant Kumar Pattnaik, Rajib Mall, "Fundamentals of Mobile Computing", PHI Learning Pvt. Ltd, New Delhi – 2012.


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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
6	CS6551	COMPUTER NETWORKS	<ul style="list-style-type: none">• Bluetooth• Switching• Transport layer• UDP• Reliable Stream(TCP) Byte• SMTP, POP3• HTTP• Web Services

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OBJECTIVES:

The student should be made to:

- Understand the division of network functionalities into layers.
- Be familiar with the components required to build different types of networks
- Be exposed to the required functionality at each layer
- Learn the flow control and congestion control algorithms

UNIT I	FUNDAMENTALS & LINK LAYER	9
Building a network - Requirements - Layering and protocols - Internet Architecture - Network software - Performance ; Link layer Services - Framing - Error Detection - Flow control		
UNIT II	MEDIA ACCESS & INTERNETWORKING	9
Media access control - Ethernet (802.3) - Wireless LANs - 802.11 - Bluetooth - Switching and bridging - Basic Internetworking (IP, CIDR, ARP, DHCP, ICMP)		
UNIT III	ROUTING	9
Routing (RIP, OSPF, metrics) - Switch basics - Global Internet (Areas, BGP, IPv6), Multicast - addresses - multicast routing (DVMRP, PIM)		
UNIT IV	TRANSPORT LAYER	9
Overview of Transport layer - UDP - Reliable byte stream (TCP) - Connection management - Flow control - Retransmission - TCP Congestion control - Congestion avoidance (DECbit, RED) - QoS - Application requirements		
UNIT V	APPLICATION LAYER	9
Traditional applications - Electronic Mail (SMTP, POP3, IMAP, MIME) - HTTP - Web Services - DNS - SNMP		

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Identify the components required to build different types of networks
- Choose the required functionality at each layer for given application
- Identify solution for each functionality at each layer
- Trace the flow of information from one node to another node in the network

TEXT BOOK:

1. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach", Fifth Edition, Morgan Kaufmann Publishers, 2011.

REFERENCES:

1. James F. Kurose, Keith W. Ross, "Computer Networking - A Top-Down Approach Featuring the Internet", Fifth Edition, Pearson Education, 2009.
2. Nader. F. Mir, "Computer and Communication Networks", Pearson Prentice Hall Publishers, 2010.
3. Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, "Computer Networks: An Open Source Approach", Mc Graw Hill Publisher, 2011.
4. Behrouz A. Forouzan, "Data communication and Networking", Fourth Edition, Tata McGraw - Hill, 2011.





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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
7	CS6659	ARTIFICIAL INTELLIGENCE	<ul style="list-style-type: none">• Bayesian Theory• Bayesian Network• Knowledge Acquisition• Machine Learning• Adaptive Learning• MYCIN , DART, XOON

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OBJECTIVES:

The student should be made to:

- Study the concepts of Artificial Intelligence.
- Learn the methods of solving problems using Artificial Intelligence.
- Introduce the concepts of Expert Systems and machine learning.

UNIT I	INTRODUCTION TO AI AND PRODUCTION SYSTEMS	9
Introduction to AI-Problem formulation, Problem Definition -Production systems, Control strategies, Search strategies. Problem characteristics, Production system characteristics -Specialized production system- Problem solving methods - Problem graphs, Matching, Indexing and Heuristic functions -Hill Climbing-Depth first and Breath first, Constraints satisfaction - Related algorithms, Measure of performance and analysis of search algorithms.		
UNIT II	REPRESENTATION OF KNOWLEDGE	9
Game playing - Knowledge representation, Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic-Structured representation of knowledge.		
UNIT III	KNOWLEDGE INFERENCE	9
Knowledge representation -Production based system, Frame based system. Inference - Backward chaining, Forward chaining, Rule value approach, Fuzzy reasoning - Certainty factors, Bayesian Theory-Bayesian Network-Dempster - Shafer theory.		
UNIT IV	PLANNING AND MACHINE LEARNING	9
Basic plan generation systems - Strips -Advanced plan generation systems – K strips -Strategic explanations -Why, Why not and how explanations. Learning- Machine learning, adaptive Learning.		
UNIT V	EXPERT SYSTEMS	9
Expert systems - Architecture of expert systems, Roles of expert systems - Knowledge Acquisition – Meta knowledge, Heuristics. Typical expert systems - MYCIN, DART, XOON, Expert systems shells.		

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

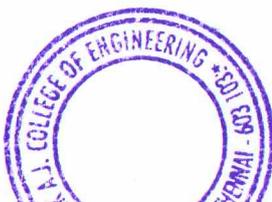
- Identify problems that are amenable to solution by AI methods.
- Identify appropriate AI methods to solve a given problem.
- Formalise a given problem in the language/framework of different AI methods.
- Implement basic AI algorithms.
- Design and carry out an empirical evaluation of different algorithms on a problem formalisation, and state the conclusions that the evaluation supports.

TEXT BOOKS:

1. Kevin Night and Elaine Rich, Nair B., "Artificial Intelligence (SIE)", Mc Graw Hill- 2008.(Units- I,II,VI & V)
2. Dan W. Patterson, "Introduction to AI and ES", Pearson Education, 2007. (Unit-III).

REFERENCES:

1. Peter Jackson, "Introduction to Expert Systems", 3rd Edition, Pearson Education, 2007.
2. Stuart Russel and Peter Norvig "AI - A Modern Approach", 2nd Edition, Pearson Education 2007.
3. Deepak Khemani "Artificial Intelligence", Tata Mc Graw Hill Education 2013.





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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
8	CS6701	CRYPTOGRAPHY AND NETWORK SECURITY	<ul style="list-style-type: none">• Network Security Model• Encryption Techniques• RC5 Algorithm• MAC• MD5• SHA• HMAC• CMAC• Virus Related Threats• Firewalls Design Principles• IP and IPV6 Authentication.

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OBJECTIVES:

The student should be made to:

- Understand OSI security architecture and classical encryption techniques.
- Acquire fundamental knowledge on the concepts of finite fields and number theory.
- Understand various block cipher and stream cipher models.
- Describe the principles of public key cryptosystems, hash functions and digital signature.

UNIT I INTRODUCTION & NUMBER THEORY

10

Services, Mechanisms and attacks-the OSI security architecture-Network security model-Classical Encryption techniques (Symmetric cipher model, substitution techniques, transposition techniques, steganography).FINITE FIELDS AND NUMBER THEORY: Groups, Rings, Fields-Modular arithmetic-Euclid's algorithm-Finite fields- Polynomial Arithmetic -Prime numbers-Fermat's and Euler's theorem-Testing for primality -The Chinese remainder theorem- Discrete logarithms.

UNIT II BLOCK CIPHERS & PUBLIC KEY CRYPTOGRAPHY

10

Data Encryption Standard-Block cipher principles-block cipher modes of operation-Advanced Encryption Standard (AES)-Triple DES-Blowfish-RC5 algorithm. **Public key cryptography:** Principles of public key cryptosystems-The RSA algorithm-Key management - Diffie Hellman Key exchange-Elliptic curve arithmetic-Elliptic curve cryptography.

UNIT III HASH FUNCTIONS AND DIGITAL SIGNATURES

8

Authentication requirement - Authentication function - MAC - Hash function - Security of hash function and MAC -MD5 - SHA - HMAC - CMAC - Digital signature and authentication protocols - DSS - El Gamal - Schnorr.

UNIT IV SECURITY PRACTICE & SYSTEM SECURITY

8

Authentication applications - Kerberos - X.509 Authentication services - Internet Firewalls for Trusted System: Roles of Firewalls - Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions. Intruder - Intrusion detection system - Virus and related threats - Countermeasures - Firewalls design principles - Trusted systems - Practical implementation of cryptography and security.

UNIT V E-MAIL, IP & WEB SECURITY

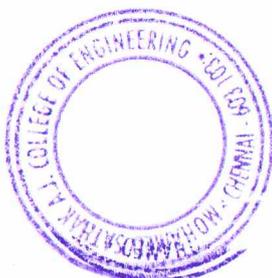
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E-mail Security: Security Services for E-mail-attacks possible through E-mail - establishing keys privacy-authentication of the source-Message Integrity-Non-repudiation-Pretty Good Privacy-S/MIME. **IP Security:** Overview of IPSec - IP and IPv6-Authentication Header-Encapsulation Security Payload (ESP)-Internet Key Exchange (Phases of IKE, ISAKMP/IKE Encoding). **Web Security:** SSL/TLS Basic Protocol-computing the keys- client authentication-PKI as deployed by SSL Attacks fixed in v3-Exportability-Encoding-Secure Electronic Transaction (SET).

TOTAL: 45 PERIODS**OUTCOMES:**

Upon Completion of the course, the students should be able to:

- Compare various Cryptographic Techniques
- Design Secure applications
- Inject secure coding in the developed applications





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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
9	IT6702	DATA WAREHOUSING AND DATA MINING	<ul style="list-style-type: none">• Online Analytical Processing• Bayesian Classification• Clustering High Dimensional Data• Based Cluster Analysis

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IT6702

DATA WAREHOUSING AND DATA MINING

LT PC 3 (

OBJECTIVES:

The student should be made to:

- Be familiar with the concepts of data warehouse and data mining,
- Be acquainted with the tools and techniques used for Knowledge Discovery in Databases.

UNIT I DATA WAREHOUSING

Data warehousing Components –Building a Data warehouse – Mapping the Data Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata.

9

UNIT II BUSINESS ANALYSIS

Reporting and Query tools and Applications – Tool Categories – The Need for Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need – Multidimensional Data Model – OLAP Guidelines – Multidimensional versus Multirelational OLAP – Categories of Tools – OLAP Tools and the Internet.

9

UNIT III DATA MINING

Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse – Issues –Data Preprocessing.

9

UNIT IV ASSOCIATION RULE MINING AND CLASSIFICATION

Mining Frequent Patterns, Associations and Correlations – Mining Methods – Mining various Kinds of Association Rules – Correlation Analysis – Constraint Based Association Mining – Classification and Prediction - Basic Concepts - Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction.

9

UNIT V CLUSTERING AND TRENDS IN DATA MINING

Cluster Analysis - Types of Data – Categorization of Major Clustering Methods – K-means– Partitioning Methods – Hierarchical Methods - Density-Based Methods –Grid Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data - Constraint – Based Cluster Analysis – Outlier Analysis – Data Mining Applications.

9

OUTCOMES:

TOTAL: 45 PERIODS

After completing this course, the student will be able to:

- Apply data mining techniques and methods to large data sets.
- Use data mining tools.
- Compare and contrast the various classifiers.

TEXT BOOKS:

1. Alex Berson and Stephen J.Smith, "Data Warehousing, Data Mining and OLAP", Tata McGraw Hill Edition, Thirteenth Reprint 2008.
2. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Third



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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
10	IT6503	WEB PROGRAMMING	<ul style="list-style-type: none">• JDBC Implementation• Connection class• Servlet• Web Services• JAVA Web Services

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IT6503

WEB PROGRAMMING

LTP C31

OBJECTIVES:

The student should be made to:

- Understand the technologies used in Web Programming.
- Know the importance of object oriented aspects of Scripting.
- Understand creating database connectivity using JDBC.
- Learn the concepts of web based application using sockets.

UNIT I SCRIPTING.

Web page Designing using HTML, Scripting basics- Client side and server side scripting. Java Script- Object, names, literals, operators and expressions- statements and features- events - windows - documents - frames - data types - built-in functions- Browser object model - Verifying forms.-HTML5- CSS3- HTML 5 canvas - Web site creation using tools.

9

UNIT II JAVA

Introduction to object oriented programming-Features of Java – Data types, variables and arrays – Operators – Control statements – Classes and Methods – Inheritance. Packages and Interfaces – Exception Handling – Multithreaded Programming – Input/Output – Files – Utility Classes – String Handling.

9

UNIT III JDBC

JDBC Overview – JDBC implementation – Connection class – Statements - Catching Database Results, handling database Queries. Networking– InetAddress class – URL class- TCP sockets - UDP sockets, Java Beans –RMI.

9

UNIT IV APPLETS

Java applets- Life cycle of an applet – Adding images to an applet – Adding sound to an applet. Passing parameters to an applet. Event Handling. Introducing AWT: Working with Windows Graphics and Text. Using AWT Controls, Layout Managers and Menus. Servlet – life cycle of a servlet. The Servlet API, Handling HTTP Request and Response, using Cookies, Session Tracking. Introduction to JSP.

9

UNIT V XML AND WEB SERVICES

Xml – Introduction-Form Navigation-XML Documents- XSL – XSLT- Web services- UDDI-WSDL- Java web services – Web resources.

9

PERIODS

TOTAL (L:45+T:15): 60

OUTCOMES:

Upon Completion of the course, the students will be able to

- Design web pages.
- Use technologies of Web Programming.
- Apply object oriented aspects to Scripting.
- Create databases with connectivity using JDBC.
- Build web based application using sockets.

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TEXT BOOKS

1. Harvey Deitel, Abbey Deitel, Internet and World Wide Web: How To Program 5th Edition





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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
11	CS6008	HUMAN COMPUTER INTERACTION	<ul style="list-style-type: none">• Software Lifecycle• Multimedia and WWW• Mobile Design, Elements of Mobile Design


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OBJECTIVES:

The student should be made to:

- Learn the foundations of Human Computer Interaction.
- Be familiar with the design technologies for individuals and persons with disabilities.
- Be aware of mobile HCI.
- Learn the guidelines for user interface.

UNIT I FOUNDATIONS OF HCI

9

The Human: I/O channels - Memory - Reasoning and problem solving; The computer: Devices - Memory - processing and networks; Interaction: Models - frameworks - Ergonomics - styles - elements - interactivity- Paradigms.

UNIT II DESIGN & SOFTWARE PROCESS

9

Interactive Design basics - process - scenarios - navigation - screen design - Iteration and prototyping. HCI in software process - software life cycle - usability engineering - Prototyping in practice - design rationale. Design rules - principles, standards, guidelines, rules. Evaluation Techniques - Universal Design.

UNIT III MODELS AND THEORIES

9

Cognitive models -Socio-Organizational issues and stake holder requirements -Communication and collaboration models-Hypertext, Multimedia and WWW.

UNIT IV MOBILE HCI

9

Mobile Ecosystem: Platforms, Application frameworks- Types of Mobile Applications: Widgets, Applications, Games- Mobile Information Architecture, Mobile 2.0, Mobile Design: Elements of Mobile Design, Tools.

UNIT V WEB INTERFACE DESIGN

9

Designing Web Interfaces - Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow. Case Studies.

L: 45, T: 0, TOTAL: 45 PERIODS

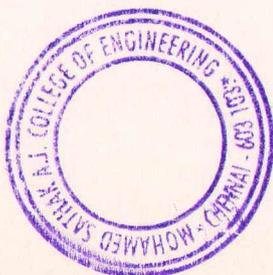
OUTCOMES:

Upon completion of the course, the student should be able to:

- Design effective dialog for HCI.
- Design effective HCI for individuals and persons with disabilities.
- Assess the importance of user feedback.
- Explain the HCI implications for designing multimedia/ ecommerce/ e-learning Web sites.
- Develop meaningful user interface.

TEXT BOOKS:

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, "Human Computer Interaction", 3rd Edition, Pearson Education, 2004 (UNIT I , II & III).
2. Brian Fling, "Mobile Design and Development", First Edition , O'Reilly Media Inc., 2009 (UNIT -IV).
3. Bill Scott and Theresa Neil, "Designing Web Interfaces", First Edition, O'Reilly, 2009.(UNIT-V).





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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
12	IT6701	INFORMATION MANAGEMENT	<ul style="list-style-type: none">• Datasystems including NOSQL• Data Privacy Principles• Master Data Management• Archive Data using Hadoop• Testing


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IT6701

INFORMATION MANAGEMENT

LT PC 31

OBJECTIVES:

- To expose students with the basics of managing the information
- To explore the various aspects of database design and modelling,
- To examine the basic issues in information governance and information integration
- To understand the overview of information architecture.

UNIT I DATABASE MODELLING, MANAGEMENT AND DEVELOPMENT

Database design and modelling - Business Rules and Relationship; Java database Connectivity (JDBC), Database connection Manager, Stored Procedures. Trends in Big Data systems including NoSQL - Hadoop HDFS, MapReduce, Hive, and enhancements.

9

UNIT II DATA SECURITY AND PRIVACY

Program Security, Malicious code and controls against threats; OS level protection; Security – Firewalls, Network Security Intrusion detection systems. Data Privacy principles. Data Privacy Laws and compliance.

9

UNIT III INFORMATION GOVERNANCE

Master Data Management (MDM) – Overview, Need for MDM, Privacy, regulatory requirements and compliance. Data Governance – Synchronization and data quality management.

9

UNIT IV INFORMATION ARCHITECTURE

Principles of Information architecture and framework, Organizing information, Navigation systems and Labelling systems, Conceptual design, Granularity of Content.

9

UNIT V INFORMATION LIFECYCLE MANAGEMENT

Data retention policies; Confidential and Sensitive data handling, lifecycle management costs. Archive data using Hadoop; Testing and delivering big data applications for performance and functionality; Challenges with data administration;

9

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course the students will be able to:

- Cover core relational database topics including logical and physical design and modeling
- Design and implement a complex information system that meets regulatory requirements; define and manage an organization's key master data entities
- Design, Create and maintain data warehouses.
- Learn recent advances in NOSQL , Big Data and related tools.



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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
13	IT6004	SOFTWARE TESTING	<ul style="list-style-type: none">• Developer/Tester support of developing a Defect Repository.• Integration Test Planning.• Adhoc Testing• Alpha Beta test• Test Management.

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OBJECTIVES:

The student should be made to:

- Expose the criteria for test cases.
- Learn the design of test cases.
- Be familiar with test management and test automation techniques.
- Be exposed to test metrics and measurements.

UNIT I INTRODUCTION

Testing as an Engineering Activity – Testing as a Process – Testing axioms – Basic definitions – Software Testing Principles – The Tester's Role in a Software Development Organization – Origins of Defects – Cost of defects – Defect Classes – The Defect Repository and Test Design – Defect Examples – Developer/Tester Support of Developing a Defect Repository – Defect Prevention strategies.

9

UNIT II TEST CASE DESIGN

Test case Design Strategies – Using Black Box Approach to Test Case Design – Random Testing – Requirements based testing – Boundary Value Analysis – Equivalence Class Partitioning – State-based testing – Cause-effect graphing – Compatibility testing – user documentation testing – domain testing – Using White Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing – Coverage and Control Flow Graphs – Covering Code Logic – Paths – code complexity testing – Evaluating Test Adequacy Criteria.

9

UNIT III LEVELS OF TESTING

The need for Levers of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests – The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination System Testing – Acceptance testing – Performance testing – Regression Testing – Internationalization testing – Ad-hoc testing – Alpha, Beta Tests – Testing OO systems – Usability and Accessibility testing – Configuration testing – Compatibility testing – Testing the documentation – Website testing.

9

UNIT IV TEST AMANAGEMENT

People and organizational issues in testing – Organization structures for testing teams – testing services – Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process – Reporting Test Results – The role of three groups in Test Planning and Policy Development – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group.

9

UNIT V TEST AUTOMATION

Software test automation – skill needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation – Test metrics and measurements – project, progress and productivity metrics.

9



TOTAL: 45 PERIODS

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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
14	IT6801	SERVICE ORIENTED ARCHITECTURE	<ul style="list-style-type: none">• XML Schema• Modeling Databases in XML• Principles of Service Orientation.• Service Discovery• WS Policy• WS Security• SOA Support in J2EE

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OBJECTIVES:

The student should be made to:

- Learn XML fundamentals.
- Be exposed to build applications based on XML.
- Understand the key principles behind SOA.
- Be familiar with the web services technology elements for realizing SOA.
- Learn the various web service standards.

UNIT I INTRODUCTION TO XML

XML document structure - Well formed and valid documents - Namespaces - DTD - XML Schema - X-Files. 9

UNIT II BUILDING XML-BASED APPLICATIONS

Parsing XML - using DOM, SAX - XML Transformation and XSL - XSL Formatting - Modeling Databases in XML. 9

UNIT III SERVICE ORIENTED ARCHITECTURE

Characteristics of SOA, Comparing SOA with Client-Server and Distributed architectures - Benefits of SOA -- Principles of Service orientation - Service layers. 9

UNIT IV WEB SERVICES

Service descriptions - WSDL - Messaging with SOAP - Service discovery - UDDI - Message Exchange Patterns - Orchestration - Choreography - WS Transactions. 9

UNIT V BUILDING SOA-BASED APPLICATIONS

Service Oriented Analysis and Design - Service Modeling - Design standards and guidelines -- Composition - WS-BPEL - WS-Coordination - WS-Policy - WS-Security - SOA support in J2EE 9

TOTAL : 45 PERIODS

OUTCOMES:

Upon successful completion of this course, students will be able to:

- Build applications based on XML.
- Develop web services using technology elements.
- Build SOA-based applications for intra-enterprise and inter-enterprise applications.

TEXTBOOKS:

1. Ron Schmelzer et al. "XML and Web Services", Pearson Education, 2002.
2. Thomas Erl, "Service Oriented Architecture: Concepts, Technology, and Design", Pearson Education, 2005.

REFERENCES:

1. Frank P.Coyle, "XML, Web Services and the Data Revolution", Pearson Education, 2002
2. Eric Newcomer, Greg Lomow, "Understanding SOA with Web Services", Pearson Education, 2005
3. Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services: An Architect's Guide", Prentice Hall, 2004.
4. James McGovern, Sameer Tyagi, Michael E.Stevens, Sunil Mathew, "Java Web Services Architecture", Morgan Kaufmann Publishers, 2003.

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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
15	CS6304	ANALOG AND DIGITAL COMMUNICATION	<ul style="list-style-type: none">• Theory of Frequency and Phase Modulation• Pulse time modulation (PTM)• Pulse Code Modulation (PCM)• Error Control Coding• Linear Block Codes• Cyclic Codes• Global System for mobile communication(GSM)• Code Division Multiple Access (CDMA)

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OBJECTIVES:

The student should be made to:

- Understand analog and digital communication techniques.
- Learn data and pulse communication techniques.
- Be familiarized with source and Error control coding.
- Gain knowledge on multi-user radio communication.

UNIT I ANALOG COMMUNICATION

9

Noise: Source of Noise - External Noise- Internal Noise- Noise Calculation. Introduction to Communication Systems: Modulation - Types - Need for Modulation. Theory of Amplitude Modulation - Evolution and Description of SSB Techniques - Theory of Frequency and Phase Modulation - Comparison of various Analog Communication System (AM - FM - PM).

UNIT II DIGITAL COMMUNICATION

9

Amplitude Shift Keying (ASK) - Frequency Shift Keying (FSK) Minimum Shift Keying (MSK) -Phase Shift Keying (PSK) - BPSK - QPSK - 8 PSK - 16 PSK - Quadrature Amplitude Modulation (QAM) - 8 QAM - 16 QAM - Bandwidth Efficiency- Comparison of various Digital Communication System (ASK - FSK - PSK - QAM).

UNIT III DATA AND PULSE COMMUNICATION

9

Data Communication: History of Data Communication - Standards Organizations for Data Communication- Data Communication Circuits - Data Communication Codes - Error Detection and Correction Techniques - Data communication Hardware - serial and parallel interfaces.

Pulse Communication: Pulse Amplitude Modulation (PAM) - Pulse Time Modulation (PTM) - Pulse code Modulation (PCM) - Comparison of various Pulse Communication System (PAM - PTM - PCM).

UNIT IV SOURCE AND ERROR CONTROL CODING

9

Entropy, Source encoding theorem, Shannon fano coding, Huffman coding, mutual information, channel capacity, channel coding theorem, Error Control Coding, linear block codes, cyclic codes, convolution codes, viterbi decoding algorithm.

UNIT V MULTI-USER RADIO COMMUNICATION

9

Advanced Mobile Phone System (AMPS) - Global System for Mobile Communications (GSM) - Code division multiple access (CDMA) - Cellular Concept and Frequency Reuse - Channel Assignment and Hand off - Overview of Multiple Access Schemes - Satellite Communication - Bluetooth.

TOTAL: 45 PERIODS**OUTCOMES:**

At the end of the course, the student should be able to:

- Apply analog and digital communication techniques.
- Use data and pulse communication techniques.
- Analyze Source and Error control coding.
- Utilize multi-user radio communication.

TEXT BOOK:

1. Wayne Tomasi, "Advanced Electronic Communication Systems", 6th Edition, Pearson Education, 2009.

REFERENCES:

1. Simon Haykin, "Communication Systems", 4th Edition, John Wiley & Sons, 2004


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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
16	CS6302	DATABASE MANAGEMENT SYSTEMS	<ul style="list-style-type: none">• Data Models• Entity Relationship Model• Query Processing and Optimization• Static Hashing• Dynamic Hashing• Data Warehouse• Mining• Classification-Association• Object Oriented Databases

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OBJECTIVES:

- To expose the students to the fundamentals of Database Management Systems.
- To make the students understand the relational model.
- To familiarize the students with ER diagrams.
- To expose the students to SQL.
- To make the students to understand the fundamentals of Transaction Processing and Query Processing.
- To familiarize the students with the different types of databases.
- To make the students understand the Security Issues in Databases.

UNIT I INTRODUCTION TO DBMS

10

File Systems Organization - Sequential, Pointer, Indexed, Direct - Purpose of Database System- Database System Terminologies-Database characteristics- Data models – Types of data models – Components of DBMS- Relational Algebra. LOGICAL DATABASE DESIGN: Relational DBMS - Codd's Rule - Entity-Relationship model - Extended ER Normalization – Functional Dependencies, Anomaly- 1NF to 5NF- Domain Key Normal Form – Denormalization

UNIT II SQL & QUERY OPTIMIZATION

8

SQL Standards - Data types - Database Objects- DDL-DML-DCL-TCL-Embedded SQL-Static Vs Dynamic SQL - QUERY OPTIMIZATION: Query Processing and Optimization - Heuristics and Cost Estimates in Query Optimization.

UNIT III TRANSACTION PROCESSING AND CONCURRENCY CONTROL

8

Introduction-Properties of Transaction- Serializability- Concurrency Control – Locking Mechanisms- Two Phase Commit Protocol-Dead lock.

UNIT IV TRENDS IN DATABASE TECHNOLOGY

10

Overview of Physical Storage Media – Magnetic Disks – RAID – Tertiary storage – File Organization – Organization of Records in Files – Indexing and Hashing –Ordered Indices – B+ tree Index Files – B tree Index Files – Static Hashing – Dynamic Hashing - Introduction to Distributed Databases- Client server technology- Multidimensional and Parallel databases- Spatial and multimedia databases- Mobile and web databases- Data Warehouse-Mining- Data marts.

UNIT V ADVANCED TOPICS

9

DATABASE SECURITY: Data Classification-Threats and risks – Database access Control – Types of Privileges –Cryptography- Statistical Databases.- Distributed Databases-Architecture-Transaction Processing-Data Warehousing and Mining-Classification-Association rules-Clustering-Information Retrieval- Relevance ranking-Crawling and Indexing the Web- Object Oriented Databases-XML Databases.

OUTCOMES:

TOTAL: 45 PERIODS

At the end of the course, the student should be able to:

- Design Databases for applications.
- Use the Relational model, ER diagrams.
- Apply concurrency control and recovery mechanisms for practical problems.
- Design the Query Processor and Transaction Processor.
- Apply security concepts to databases.



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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
17	CS6402	DESIGN AND ANALYSIS OF ALGORITHMS	<ul style="list-style-type: none">• Analysis Framework• Asymptotic Notations• Prims Algorithm• Kruskal's Algorithm• Maximum Flow Problem• Backtracking• N- Queens Problem• Travelling Salesman Problem

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OBJECTIVES:

The student should be made to:

- Learn the algorithm analysis techniques.
- Become familiar with the different algorithm design techniques.
- Understand the limitations of Algorithm power.

UNIT I INTRODUCTION

9

Notion of an Algorithm - Fundamentals of Algorithmic Problem Solving - Important Problem Types - Fundamentals of the Analysis of Algorithm Efficiency - Analysis Framework - Asymptotic Notations and its properties - Mathematical analysis for Recursive and Non-recursive algorithms.

UNIT II BRUTE FORCE AND DIVIDE-AND-CONQUER

9

Brute Force - Closest-Pair and Convex-Hull Problems-Exhaustive Search - Traveling Salesman Problem - Knapsack Problem - Assignment problem.

Divide and conquer methodology - Merge sort - Quick sort - Binary search - Multiplication of Large Integers - Strassen's Matrix Multiplication-Closest-Pair and Convex-Hull Problems.

UNIT III DYNAMIC PROGRAMMING AND GREEDY TECHNIQUE

9

Computing a Binomial Coefficient - Warshall's and Floyd's algorithm - Optimal Binary Search Trees - Knapsack Problem and Memory functions. Greedy Technique- Prim's algorithm- Kruskal's Algorithm- Dijkstra's Algorithm-Huffman Trees.

UNIT IV ITERATIVE IMPROVEMENT

9

The Simplex Method-The Maximum-Flow Problem - Maximum Matching in Bipartite Graphs- The Stable marriage Problem.

UNIT V COPING WITH THE LIMITATIONS OF ALGORITHM POWER

9

Limitations of Algorithm Power-Lower-Bound Arguments-Decision Trees-P, NP and NP-Complete Problems--Coping with the Limitations - Backtracking - n-Queens problem - Hamiltonian Circuit Problem - Subset Sum Problem-Branch and Bound - Assignment problem - Knapsack Problem - Traveling Salesman Problem- Approximation Algorithms for NP - Hard Problems - Traveling Salesman problem - Knapsack problem.

TOTAL: 45 PERIODS**OUTCOMES:**

At the end of the course, the student should be able to:

- Design algorithms for various computing problems.
- Analyze the time and space complexity of algorithms.
- Critically analyze the different algorithm design techniques for a given problem.
- Modify existing algorithms to improve efficiency.

TEXT BOOK:

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Third Edition, Pearson Education, 2012.

REFERENCES:

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, PHI Learning Private Limited, 2012.
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, "Data Structures and Algorithms", Pearson Education, Reprint 2006.
3. Donald E. Knuth, "The Art of Computer Programming", Volumes 1 & 3 Pearson Education, 2009.
Steven S. Skiena, "The Algorithm Design Manual", Second Edition, Springer, 2008.



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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
18	CS6003	ADHOC AND SENSOR NETWORKS	<ul style="list-style-type: none">• Applications of Adhoc and Sensor Networks• TCP over Adhoc Wireless Networks• MAC layer• CSMA based MAC• IEEE 802.15.4• OLSR• Localization• Indoor and Sensor Network Localisation


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OBJECTIVES:

The student should be made to:

- Understand the design issues in ad hoc and sensor networks.
- Learn the different types of MAC protocols.
- Be familiar with different types of adhoc routing protocols.
- Be expose to the TCP issues in adhoc networks.
- Learn the architecture and protocols of wireless sensor networks..

UNIT I INTRODUCTION

9

Fundamentals of Wireless Communication Technology – The Electromagnetic Spectrum – Radio propagation Mechanisms – Characteristics of the Wireless Channel -mobile ad hoc networks (MANETs) and wireless sensor networks (WSNs) :concepts and architectures. Applications of Ad Hoc and Sensor networks. Design Challenges in Ad hoc and Sensor Networks.

UNIT II MAC PROTOCOLS FOR AD HOC WIRELESS NETWORKS

9

Issues in designing a MAC Protocol- Classification of MAC Protocols- Contention based protocols- Contention based protocols with Reservation Mechanisms- Contention based protocols with Scheduling Mechanisms – Multi channel MAC-IEEE 802.11

UNIT III ROUTING PROTOCOLS AND TRANSPORT LAYER IN AD HOC WIRELESS NETWORKS

9

Issues in designing a routing and Transport Layer protocol for Ad hoc networks- proactive routing, reactive routing (on-demand), hybrid routing- Classification of Transport Layer solutions-TCP over Ad hoc wireless Networks.

UNIT IV WIRELESS SENSOR NETWORKS (WSNS) AND MAC PROTOCOLS

9

single node architecture: hardware and software components of a sensor node - WSN Network architecture: typical network architectures-data relaying and aggregation strategies -MAC layer protocols: self-organizing, Hybrid TDMA/FDMA and CSMA based MAC- IEEE 802.15.4.

UNIT V WSN ROUTING, LOCALIZATION & QOS

9

Issues in WSN routing - OLSR- Localization - Indoor and Sensor Network Localization-absolute and relative localization, triangulation-QOS in WSN-Energy Efficient Design-Synchronization-Transport Layer issues.

TOTAL: 45 PERIODS**OUTCOMES:**

Upon completion of the course, the student should be able to:

- Explain the concepts, network architectures and applications of ad hoc and wireless sensor networks.
- Analyze the protocol design issues of ad hoc and sensor networks.
- Design routing protocols for ad hoc and wireless sensor networks with respect to some protocol design issues.
- Evaluate the QoS related performance measurements of ad hoc and sensor networks.

TEXT BOOK:

1. C. Siva Ram Murthy, and B. S. Manoj, "Ad hoc Wireless Networks: Architectures and Protocols", Prentice Hall Professional Technical Reference, 2008.

REFERENCES:

1. Carlos De Morais Cordeiro, Dharma Prakash Agrawal "Ad Hoc & Sensor Networks: Theory and Applications", World Scientific Publishing Company, 2006.

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GARBAGE MONITORING SYSTEM USING IOT

A PROJECT REPORT

Submitted by

MISBA FATHIMA.G (311814205002)

PAVITHRA.G(311814205004)

In partial fulfilment for the award of the degree

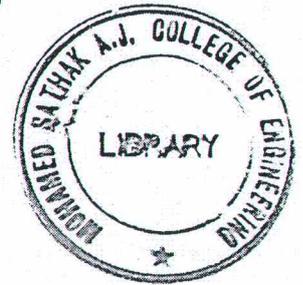
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BACHELOR OF TECHNOLOGY

IN

INFORMATION TECHNOLOGY

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APRIL 2018

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Certified that this project report "**GARBAGE MONITORING SYSTEM USING IOT**" is the bonafide work of "MISBA FATHIMA.G(311814205002), PAVITHRA.G (311814205004)" who carried out the project work under my supervision.



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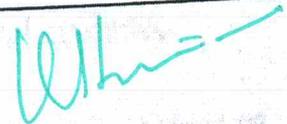
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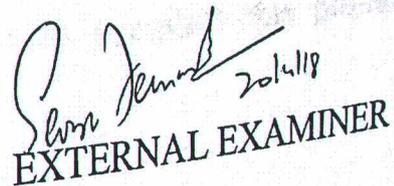
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EXTERNAL EXAMINER



20/4/18
EXTERNAL EXAMINER

ABSTRACT

As a developing nation and as one of the most populous country in the world we in India face unique problems that require a unique solution such problem is that of waste management. As of there is no proper monitoring system on the working of labors whoever working in the corporations, if they are failed to clean the garbage bins within the stipulated time then there must be overflow and so as diseases and hazardous gases spreads easily which makes city or town worst solid management. Our proposed system continuously monitors the regularity of cleaning the garbage bins by labours and reports the same to the corresponding Authority. From Ancestors to today solid waste was majorly due to less usage of natural resources and more of artificial facts. The major sources of wastage during past decade were largely vestiges and human ecological waste, brought into the society with less impact on others. No automatic or technology oriented systems exist. This project is designed for the effective garbage collection using Embedded System. The main aim of the proposed method is collecting waste into the dumping vehicles. In this method when ever dustbin filled to certain levels the module placed on the dustbin will send an alert message to server node. From the server node it again sends a message to the concerned authorities. This system also sends information about harmful gases emanation.

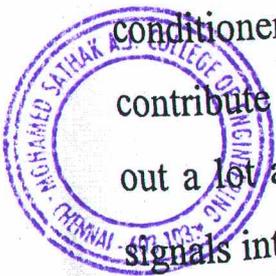



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APPENDIX 3

CONCLUSION

Garbage Management is a big issue for everyone to need action across it immediately. This report presents the work accomplished on real time solid waste municipal garbage bins monitoring system. Solid waste can be monitored effectively by sending alert to the local corporation. If the garbage in garbage bin is not cleared in a specific period of time then alert will be sent to the head office so that proper action will be taken accordingly. In this way time can be managed and solid waste can be monitored effectively. So finally we conclude that our system is so much helpful for monitoring the bins effectively without overflowing onto the streets. This monitoring system is helpful for monitoring the garbage in garbage bins. This can be implemented in present days, as solid waste management is big issue throughout the world. This project helps in reduction of solid waste management problems so that helpful in increasing public health safety precautions by Government. Technology is been used to provide better garbage disposal methods in urban areas. When dustbin is full or overflowed then ultrasonic sensor is detected the dustbin status is shown on PC by using GUI. This type of system is used in college campus, offices and many places where it is suitable. With the combination of Arduino, and the Bluetooth Shield we can control over many other things, like home Lightings, air conditioner and many more through our cell phones. The Arduino can also contribute at large for the SmartHome system. By doing this Project we found out a lot about the Arduino, and how it has made us easier to convert digital signals into physical movements. One more advantage of Arduino is that once a program is burned we don't need to worry about the program getting erased as long as it is not RESET. Arduino has also over all other microcontroller because of its efficiency and user friendly property.



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FLOWER BUDDY

A PROJECT REPORT

Submitted by

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TAMILSELVI.M(311814205007)

In partial fulfillment for the award of the degree

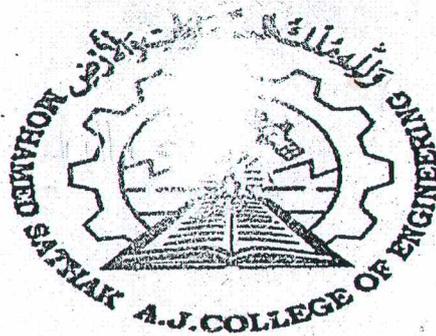
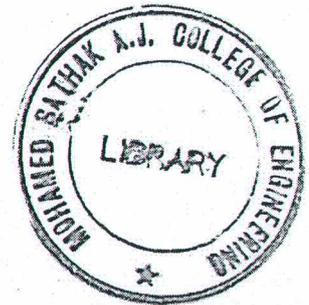
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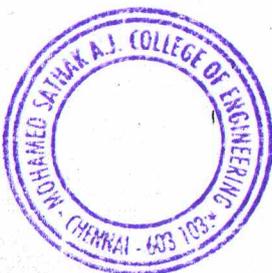
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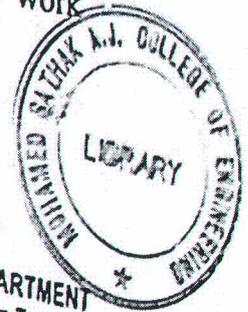
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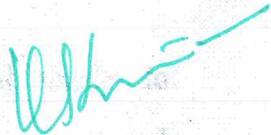
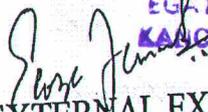
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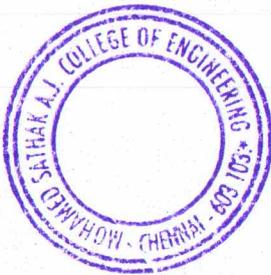



INTERNAL EXAMINER


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EXTERNAL EXAMINER

ABSTRACT

The world is fastly turned into digitalization so every individual is expecting desired product without wasting time. Project Proposal is based on image search which involves artificial intelligence with E-Commerce website , a kind of model called a deep convolutional neural networks helps to train a model in tensorflow tool .Thus can get a classified result. Involves website creation and classification of image as a proof model. TensorFlow for high performance numerical computation. Its flexible architecture allows easy deployment of computation across a variety of platforms (CPUs, GPUs, TPUs), and from desktops to clusters of servers to mobile and edge devices. Originally developed by researchers and engineers from the Google Brain team within Google's AI organization, it comes with strong support for machine learning and deep learning and the flexible numerical computation core is used across many other scientific domains. Using the same concept to create website and classification of image as a proof model.



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APPENDIX 3

CONCLUSION

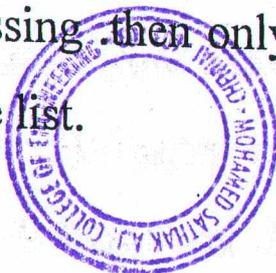
In the project proposal a system based on image search which involves artificial intelligence with E-Commerce website, a kind of model called a deep convolutional neural networks helps to train a model in tensorflow tool. It can get a classified result. Project have created website and classification of image as a proof model. TensorFlow for high performance numerical computation. Its flexible architecture allows easy deployment of computation across a variety of platforms (CPUs, GPUs, TPUs), and from desktops to clusters of servers to mobile and edge devices. Originally developed by researchers and engineers from the Google Brain team within Google's AI organization, it comes with strong support for machine learning and deep learning and the flexible numerical computation core is used across many other scientific domains. Using the same concept to created website and classification of image as a proof model.

FUTURE ENHANCEMENT

In future enhancement in this project have to create API for joining website with image processing. then only user can able to list the product based on which matches the list.



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**DYNAMIC CHANGE SECURED DATA ACCESS WITH
ENHANCED USER BEHAVIOUR BASED ALTERING
POLICY KEY USING BIGDATA IN CLOUD**

A PROJECT REPORT

Submitted by

MOHAMED KUPPA PUCKEER.A (311814205003)

RAFIDEEN.A.R(311814205005)

In partial fulfillment for the award of the degree

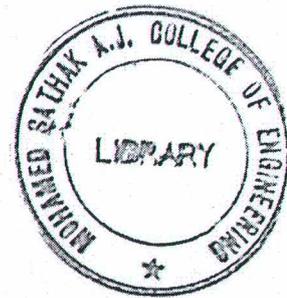
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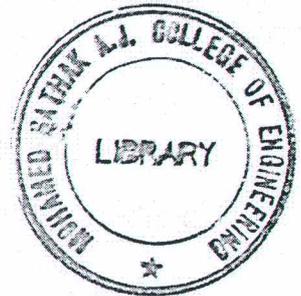
APRIL 2018



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BONAFIDE CERTIFICATE

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Submitted for the Project viva held on 20/04/2018

INTERNAL EXAMINER



EXTERNAL EXAMINER

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ABSTRACT

In the EXISTING SYSTEM, However, security has then become a greater concern. Among many other security issues, user and server authentication within an open, distributed, and cross-domain environment are a complicated matter. Security is the major thread in Cloud Computing. In the PROPOSED SYSTEM, Every user has to feed User Name, Password for Data access. Server generates the set of Keys to the Users for Data Access. Data owner uploads their data with index in server. Server split and stores the owner data in different sub-servers. ABE is used as data access policy. In the MODIFICATION Integration of Cloud & Big Data is achieved. Main cloud chunks the User data and stores in different sub Cloud servers. Admin generates. Policy Key (View / Modify) based on the User's Profile. If any user tries to misbehave an immediately alert is communicated to the Data Owner. Data Owner can change the Policy Key and Access Policy in run time. Our System should be able to update its policy automatically. We are implementing ABE Algorithm for Profile based Data Access.




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APPENDIX 3

CONCLUSION

We proposed three authenticated key exchange protocols for parallel network file system. In this project user upload the data to cloud server. That data's are chunks and stored in different sub cloud server. Data owner gives privilege to user, in case any persons hack the data's means automatically alert will be sent to data owner. Data owner only can change the policy key and access key in run time.

FUTURE ENHANCEMENT

The future work of this project , data owner can upload the data like images as well as text. In current system, owner will provide the key for access level user. Then downloader can view the data . In future images will be stored in a format of crypto and text will be in stegno form. Through this hacking also not possible.



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**DRIVE NOW CALL LATER –DETECTING DRIVER DISTRACTION USING
SMART PHONE**

A PROJECT REPORT

Submitted by

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UMAPRIYA P (311814205009)

Partial fulfillment for the award of the degree

Of

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IN

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Mohamed Sathak A.J.

PROGRESS THROUGH KNOWLEDGE

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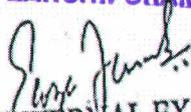
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INTERNAL EXAMINER



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EXTERNAL EXAMINER

ABSTRACT

Distracted Driving is dangerous and leads to several road accidents. In recent days, government agencies and mobile industries are taken initiatives to prevent road accidents. Most of the countries banned mobile phones while driving. But, it is not much effective to reduce risks and improve safety. The proposed method uses vehicle dynamics to manage incoming calls while driving. The difference between passenger and driver is determined by Bluetooth pairing technology. It requires a Bluetooth module to be implemented in the vehicle. When the accelerometer reading exceeds threshold value ($>5\text{kmph}$), the app will be turned on. Once the app turned on, it starts to block all incoming calls. When an incoming call is coming three times from same number, a preset alert SMS will be sent to the caller. This is done with the help of telephone manager. The app is fully customizable and four modes of operation are also presented. The proposed method is implemented in Android SDK. As a result, the driver distraction is managed efficiently and risks of mobile usage are significantly reduced.



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CONCLUSION

The proposed application uses sensors in the Smartphone and Bluetooth module. The app will be turned on when the accelerometer value exceeds the threshold limit. Bluetooth auto-pairing is done to improve the usability of mobile phone user/driver. The app is fully customizable by the user and it can operate in four modes. By default, the app will block all incoming calls automatically. When an incoming call is blocked continuously from same number, the app will send an alert SMS to the blocked number. This Safety Driver APP is developed using Android platform. This app is very useful to manage incoming calls while driving. This results to improved road safety and reduces the risks of road accident by the usage of mobile phones.



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