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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	EC6504- Microprocessor and Microcontroller
16	CS6502- Object Oriented Analysis and Design
17	CS6302- Database Management Systems
18	CS6402- Design and Analysis of Algorithms
19	CS6004- Cyber Forensics

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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	• All Operation (Insertion, Deletion, Merge, Traversal) • Separate Chaining.

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CS6202 PROGRAMMING AND DATA STRUCTURES I L T P C 3 0 0 3

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.

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BOARD OF STUDIES
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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	• Iterators • AVL Trees • B- Trees • Kruskal and prim Algorithm • Dijkstra's Algorithm

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CS6301 PROGRAMMING AND DATA STRUCTURES II L T P C 3 0 0 3

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.

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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	• SQL Server with ADO.NET • XML and .NET • Returning exceptions from SQL Server

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CS6001 C# AND .NET PROGRAMMING L T P C
3 0 0 3

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, Versoning, 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 frame work
- 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	• Open Grid Services Architecture(OGSA) • HDFS Concepts • Identity and Access Management Architecture • Saas, Paas, Iaas

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CS6703 GRID AND CLOUD COMPUTING L T P C
3 0 0 3

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.

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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	• Adoption of TCP Window • Global system for mobile communication (GSM) • Vehicular Adhoc Networks(VANET) • IOS, ANDROID.

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IT6601 MOBILE COMPUTING L T P C 3 0 0 3

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 9

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.

UNIT II MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER 9

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.

UNIT III MOBILE TELECOMMUNICATION SYSTEM 9

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

UNIT IV MOBILE AD-HOC NETWORKS 9

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 .

UNIT V MOBILE PLATFORMS AND APPLICATIONS 9

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.

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.

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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	• Multicast Routing • TCP Congestion Control • Web Services • DNS • SNMP

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CS6551 COMPUTER NETWORKS L T P C
3 0 0 3

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	• Predicate Calculus • Bayesian Network • Knowledge Acquisition

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CS6659 ARTIFICIAL INTELLIGENCE L T P C
3 0 0 3

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.

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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	• Advanced Encryption Standards(AES) • RSA Algorithm • MAC • MD5 • SHA • HMAC • CMAC • Types of Firewalls • Firewalls Design Principles

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CS6701 CRYPTOGRAPHY AND NETWORK SECURITY L T P C
3 0 0 3

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 – EI 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 9

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. **IPSecurity:** 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 SSLAttacks 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	DATAWAREHOUSING AND DATA MINING	• Online Analytical Processing • Multi relationai OLAP • Mining Methods • Rule Based Classification • Density Based Methods • Mode Based Clustering Methods

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IT6702 DATA WAREHOUSING AND DATA MINING L T P C 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 9

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.

UNIT II BUSINESS ANALYSIS 9

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.

UNIT III DATA MINING 9

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.

UNIT IV ASSOCIATION RULE MINING AND CLASSIFICATION 9

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.

UNIT V CLUSTERING AND TRENDS IN DATA MINING 9

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.

TOTAL: 45 PERIODS

OUTCOMES:

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.

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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	• Inheritance, Packages, Interfaces • TCP Sockets • The Servlet API • Web Services

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IT6503 **WEB PROGRAMMING** L T P C 3 1

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. 9

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.

UNIT II JAVA 9

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.

UNIT III JDBC 9

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.

UNIT IV APPLETS 9

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.

UNIT V XML AND WEB SERVICES 9

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

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	• Design Rules • Principles, Standards, Guidelines, Rules • Mobile Information Architectures • Designing Web Interfaces • Virtual Pages

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CS6008 HUMAN COMPUTER INTERACTION L T P C
3 0 0 3

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.

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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	• Hadoop HDFS • Network Security Intrusion detection systems • Data Governance • Archive Data using Hadoop

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IT6701 **INFORMATION MANAGEMENT** L T P C 3 (

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 9

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.

UNIT II DATA SECURITY AND PRIVACY 9

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.

UNIT III INFORMATION GOVERNANCE 9

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

UNIT IV INFORMATION ARCHITECTURE 9

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

UNIT V INFORMATION LIFECYCLE MANAGEMENT 9

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;

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	• Defect Repository • Coverage and Control flow graphs • Adhoc Testing • Testing the Documentation • Test Planning

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IT6004 SOFTWARE TESTING L T P C 3 0

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 9

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.

UNIT II TEST CASE DESIGN 9

Test case Design Strategies – Using Black Bod 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.

UNIT III LEVELS OF TESTING 9

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.

UNIT IV TEST AMANAGEMENT 9

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.

UNIT V TEST AUTOMATION 9

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.

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	• XML Schema • UDDI • Message Exchange Patterns • Service Oriented Analysis • WS Policy • WS Security

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IT6801 SERVICE ORIENTED ARCHITECTURE L T P C
3 0 0 3

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 9

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

UNIT II BUILDING XML- BASED APPLICATIONS 9

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

UNIT III SERVICE ORIENTED ARCHITECTURE 9

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

UNIT IV WEB SERVICES 9

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

UNIT V BUILDING SOA-BASED APPLICATIONS 9

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

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	EC6504	MICRO PROCESSOR AND MICRO CONTROLLER	• Modular Programming • Stacks • Procedures • Macros • Interrupts • Introduction to Multi-Programming • LED Display, LCD Display • ADC, DAC and Sensor Interfacing. • External Memory Interfacing.

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EC6504 MICROPROCESSOR AND MICROCONTROLLER L T P C
3 0 0 3

OBJECTIVES:

The student should be made to:

- Study the Architecture of 8086 microprocessor.
- Learn the design aspects of I/O and Memory Interfacing circuits.
- Study about communication and bus interfacing.
- Study the Architecture of 8051 microcontroller.

UNIT I THE 8086 MICROPROCESSOR 9

Introduction to 8086 - Microprocessor architecture - Addressing modes - Instruction set and assembler directives - Assembly language programming - Modular Programming - Linking and Relocation - Stacks - Procedures - Macros - Interrupts and interrupt service routines - Byte and String Manipulation.

UNIT II 8086 SYSTEM BUS STRUCTURE 9

8086 signals - Basic configurations - System bus timing -System design using 8086 - IO programming - Introduction to Multiprogramming - System Bus Structure - Multiprocessor configurations - Coprocessor, Closely coupled and loosely Coupled configurations - Introduction to advanced processors.

UNIT III I/O INTERFACING 9

Memory Interfacing and I/O interfacing - Parallel communication interface - Serial communication interface - D/A and A/D Interface - Timer - Keyboard /display controller - Interrupt controller - DMA controller - Programming and applications Case studies: Traffic Light control, LED display , LCD display, Keyboard display interface and Alarm Controller.

UNIT IV MICROCONTROLLER 9

Architecture of 8051 - Special Function Registers(SFRs) - I/O Pins Ports and Circuits - Instruction set - Addressing modes - Assembly language programming.

UNIT V INTERFACING MICROCONTROLLER 9

Programming 8051 Timers - Serial Port Programming - Interrupts Programming – LCD & Keyboard Interfacing - ADC, DAC & Sensor Interfacing - External Memory Interface- Stepper Motor and Waveform generation.

TOTAL: 45 PERIODS

OUTCOMES:

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

- Design and implement programs on 8086 microprocessor.
- Design I/O circuits.
- Design Memory Interfacing circuits.
- Design and implement 8051 microcontroller based systems.

TEXT BOOKS:

1. Yu-Cheng Liu, Glenn A.Gibson, "Microcomputer Systems: The 8086 / 8088 Family - Architecture, Programming and Design", Second Edition, Prentice Hall of India, 2007.
2. Mohamed Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay, "The 8051 Microcontroller and Embedded Systems: Using Assembly and C", Second Edition, Pearson Education, 2011.

REFERENCE:

1. Doughlas V.Hall, "Microprocessors and Interfacing, Programming and Hardware:,TMH, 2012

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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
16	CS6502	OBJECT ORIENTED ANALYSIS AND DESIGN	• UML Diagrams • Bridge Adapter • Associations • GOF Design Patterns • GUI Testing • OO System Testing

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CS6502 OBJECT ORIENTED ANALYSIS AND DESIGN L T P C
3 0 0 3

OBJECTIVES:

The student should be made to:

- Learn the basics of OO analysis and design skills.
- Learn the UML design diagrams.
- Learn to map design to code.
- Be exposed to the various testing techniques.

UNIT I UML DIAGRAMS 9

Introduction to OOAD - Unified Process - UML diagrams - Use Case - Class Diagrams- Interaction Diagrams - State Diagrams - Activity Diagrams - Package, component and Deployment Diagrams.

UNIT II DESIGN PATTERNS 9

GRASP: Designing objects with responsibilities - Creator - Information expert - Low Coupling - High Cohesion - Controller - Design Patterns - creational - factory method - structural - Bridge - Adapter - behavioral – Strategy – observer.

UNIT III CASE STUDY 9

Case study - the Next Gen POS system, Inception -Use case Modeling - Relating Use cases - include, extend and generalization - Elaboration - Domain Models - Finding conceptual classes and description classes - Associations - Attributes - Domain model refinement - Finding conceptual class Hierarchies - Aggregation and Composition.

UNIT IV APPLYING DESIGN PATTERNS 9

System sequence diagrams - Relationship between sequence diagrams and use cases Logical architecture and UML package diagram – Logical architecture refinement - UML class diagrams - UML interaction diagrams - Applying GoF design patterns.

UNIT V CODING AND TESTING 9

Mapping design to code - Testing: Issues in OO Testing - Class Testing - OO Integration Testing - GUI Testing – OO System Testing.

TOTAL: 45 PERIODS

OUTCOMES:

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

- Design and implement projects using OO concepts.
- Use the UML analysis and design diagrams.
- Apply appropriate design patterns.
- Create code from design.
- Compare and contrast various testing techniques.

TEXT BOOK:

1. Craig Larman, "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development", Third Edition, Pearson Education, 2005.

REFERENCES:

1. Simon Bennett, Steve Mc Robb and Ray Farmer, "Object Oriented Systems Analysis and Design Using UML", Fourth Edition, Mc-Graw Hill Education, 2010.
2. Erich Gamma, and Richard Helm, Ralph Johnson, John Vlissides, "Design patterns: Elements of Reusable Object-Oriented Software", Addison-Wesley, 1995.
3. Martin Fowler, "UML Distilled: A Brief Guide to the Standard Object Modeling Language", Third edition, Addison Wesley, 2003.

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S.No.	Subject Code	Subject Name	Name of the Content that include experiential learning through project work
17	CS6302	DATABASE MANAGEMENT SYSTEMS	• Components of DBMS • Embedded SQL • Two Phase Commit Protocol • Static Hashing • Dynamic Hashing • Distributed Databases • Data Warehouse • Mining • Data marts • Database Access Control • Cryptography • Classification-Association • Object Oriented Databases

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CS6302 **DATABASE MANAGEMENT SYSTEMS** **L T P C**
3 0 0 3

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.

TOTAL: 45 PERIODS

OUTCOMES:

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
18	CS6402	DESIGN AND ANALYSIS OF ALGORITHMS	• Asymptotic Notations • Divide and Conquer Methodology • Greedy Techniques • Kruskal's Algorithm • Backtracking • N- Queens Problem • Hamiltonian Circuit Problem • Subset sum Problem

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CS6402 **DESIGN AND ANALYSIS OF ALGORITHMS** **L T P C**
3 0 0 3

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" 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 – Maximm 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.

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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
19	CS6004	CYBER FORENSICS	• IP Authentication Header • Roles of Firewalls • Creating Response Toolkit and IR team • Software/Hardware Tools • Data Hiding Techniques.

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CS6004 **CYBER FORENSICS** L T P C
3 0 0 3

OBJECTIVES:

The student should be made to:

- Learn the security issues network layer and transport layer.
- Be exposed to security issues of the application layer.
- Learn computer forensics.
- Be familiar with forensics tools.
- Learn to analyze and validate forensics data.

UNIT I NETWORK LAYER SECURITY &TRANSPORT LAYER SECURITY 9

IPSec Protocol - IP Authentication Header - IP ESP - Key Management Protocol for IPSec.Transport layer Security: SSL protocol, Cryptographic Computations – TLS Protocol.

UNIT II E-MAIL SECURITY & FIREWALLS 9

PGP - S/MIME - Internet Firewalls for Trusted System: Roles of Firewalls – Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions.

UNIT III INTRODUCTION TO COMPUTER FORENSICS 9

Introduction to Traditional Computer Crime, Traditional problems associated with Computer Crime. Introduction to Identity Theft & Identity Fraud. Types of CF techniques - Incident and incident response methodology - Forensic duplication and investigation. Preparation for IR: Creating response tool kit and IR team. - Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition.

UNIT IV EVIDENCE COLLECTION AND FORENSICS TOOLS 9

Processing Crime and Incident Scenes – Working with Windows and DOS Systems. Current Computer Forensics Tools: Software/ Hardware Tools.

UNIT V ANALYSIS AND VALIDATION 9

Validating Forensics Data - Data Hiding Techniques - Performing Remote Acquisition - Network Forensics - Email Investigations - Cell Phone and Mobile Devices Forensics.

TOTAL: 45 PERIODS

OUTCOMES:

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

- Discuss the security issues network layer and transport layer.
- Apply security principles in the application layer.
- Explain computer forensics.
- Use forensics tools.
- Analyze and validate forensics data.

TEXT BOOKS:

1. Man Young Rhee, "Internet Security: Cryptographic Principles", "Algorithms and Protocols", Wiley Publications, 2003.
2. Nelson, Phillips, Enfinger, Steuart, "Computer Forensics and Investigations", Cengage Learning, India Edition, 2008.

REFERENCES:

1. John R.Vacca, "Computer Forensics", Cengage Learning, 2005
2. Richard E.Smith, "Internet Cryptography", 3rd Edition Pearson Education, 2008.
3. Marjie T.Britz, "Computer Forensics and Cyber Crime": An Introduction", 3rd Edition, Prentice Hall, 2013.

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QUALITY OF SERVICES ON DSR AND AODV ROUTING PROTOCOL IN WIRELESS SENSOR NETWORKS

A PROJECT REPORT

Submitted by

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G.ATHIYAMAN (311815205301)

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In partial fulfilment for the award of the degree

of

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IN

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QUALITY OF SERVICES ON DSR AND AODV ROUTING PROTOCOL IN WIRELESS SENSOR NETWORKS

ABSTRACT

Real implementation of routing protocol of WSNs is a time consuming process and expensive due to simulation evaluation. This paper presents an organized performance under water vehicles' and study of two routing protocols, Ad hoc On Demand Distance Vector (AODV) and Dynamic Source Routing (DSR) protocols for WSNs. The performance study of WSNs routing protocols is analyzed by equating important metrics like end-to-end delay, throughput, and total packets dropped, in the network under the similar random waypoint mobility model. Result shows that both AODV protocols have better performance than DSR routing protocol.

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CONCLUSION

- we proposed the use of an AUV to collect data from SNs, which are used to monitor underwater pipelines. The AUV moves back and forth along the pipeline and collects data when it comes within transmission range of an SN. The AUV then transmits the collected data to the surface sinks located at the ends of the ALSN. Typically, acoustic communication technology is used to provide the needed connectivity. This framework is appropriate for applications that involve delay-tolerant data. This proposed framework allows the WSN to avoid using multi hop communication to propagate the collected data. This leads to reduction in energy consumption and packet loss.

FUTURE ENHANCEMENTS

- We also proposed different AUV movement algorithms, and studied the effect of various system parameters such as AUV speed, data transmission rate, and range on network performance metrics such as packet delivery ratio and end-to-end delay. This framework can constitute a good foundation for further optimizations using this strategy subject to certain design parameters such as SN density, distance, network reliability, medium access control, communication channel conditions, security, and QoS requirements.

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ANDROID APPLICATION FOR PROPERTY MANAGEMENT USING CLOUD COMPUTING

A PROJECT REPORT

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ABSTRACT

The project is to manage the operations done in real estate business, In this mobi pplication obviously referring to houses that are the main concern of any re: state online property sale deals with the processes of sales and the properties he a real estate users. This system is an online real estate management throug which individuals user or buyers can view and upload the property in particula rea details using android application in cloud storage, and also given the curren price of the area. As we pointed out in our project 'Looking for property vi: smartphone the real picture through the smartphone camera by additiona information in to cloud and other user can view the property and contact the consent person.

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CHAPTER 9

CONCLUSION AND FUTURE ENHANCEMENTS

9.1 CONCLUSION:

The project report entitled has come to its conclusion. The new framework has been produced with so much consideration that it is free of blunders and in the meantime devouring. This will empower the two Buyers and Sellers to participate in the real estate process. The System has made real estate application increasingly powerful and effective in their conduct and has driven organizations to another dimension, compelling numerous to make the vital changes and changes to achieve profit with satisfactions for the users. In addition, a real estate application with advance features for all users. The further enhancement can be done for the future enhancement in the system.

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9.2 FUTURE ENHANCEMENTS:

It is not possible to develop a system that makes all the requirements of the user. User requirements keep changing as the system is being used. Some of the future enhancements that can be done to this system are:

- As the technology emerges, it is possible to upgrade the system and can be adaptable to desired environment.
- Based on the future security issues , security can be improved using emerging technologies.
- Document verification and by giving survey number of the plot that document will display in the application that module is worked can be added.
- Sub admin module can be added.

SCHOOL OF ENGINEERING

AUTOMATED SURVEILLANCE SYSTEM USING RGB VARIATION ALGORITHM

A PROJECT REPORT

Submitted by

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N.ABBASUDEEN **(311815205001)**

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ABSTRACT

Goal of this project is to automate the security surveillance system with high efficiency and detecting the anomalous event with high accuracy. Thus reducing the crime rate and reducing the human effort and human viable errors

The existing video surveillance system require a constant human presence to monitor the video which makes it prone to human errors. Workers need to be allotted in a shift wise basis in order to enable the system and it requires lot of expenditure.

Using the video footages acquired from the CCTV camera the anomalous events are detected. The project detects anomalous event like theft using RGB variation algorithm and machine learning.

Using RGB variation algorithm the difference between the frames is identified. And Using machine learning anomaly and intruder detection is done. By using the pre-defined datasets the anomaly is automatically detected.

once anomaly is detected the alert module is activated which sends alert messages to the respective authorities to take the necessary action further.

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CHAPTER 6

CONCLUSION AND FUTURE ENHANCEMENTS

n this project, a video anomaly detecting system at traffic and highways that is apable of detecting accidents and also alert the authorities has been developed. he experiment has been performed using MATLAB tool with Android alert iod . The experiment includes two accident videos and the system is able to iccessfully detect the accident. The proposed system can be used for irveillance in various fields for security purposes.The system is going to make se of video anomaly detection algorithms like STAE and AMDN which can etect alteration between frames.The system is made to learn various anomalies sing the concept of machine learning.

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o improve the performance of the detection and algorithm, problems created y hadows and occlusion is planned to be addressed by using better ackground modeling techniques and re-segmentation of the segmented vehicle egion using average color and lightness distance of blocks in the segmented bject regions. The processing speed will be increased in future and the video uality will also be improved.The future system will support unmanned live camera surveillance and monitoring. These systems can be made to send the GPS location of the abnomalous event. And also it is planned to make the object detection and tracking algorithm operate under night conditions. Also it is planned to collect more theft data from different camera angles to make the



OPTIMIZE DOCTOR EXPECTATION CHOICE USING CLOUD COMPUTING

A PROJECT REPORT

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ABSTRACT

Optimize Doctor Expectation Choice Using Cloud Computing is an application that provides services to the Doctors and Patients. The Doctor's Appointment and Prescription system connects between Doctor and Patients using web application and patients are able to search a Doctor and ask for his/her appointment as well as for prescription using their webpage . This application shows the Doctors the previous history of a particular patient and can prescribe on basis of the history of patient. The main objective of this research is connecting doctor and patient very quickly and easily from any location without any involvement of any third party. Any doctor and patient can easily use this application by registering themselves, and doctor can prescribe the patient based on disease using listed medicine and number of days etc. This system also notifies the Doctor and patient through webpage about the request of doctor appointment and prescription within shortage possible time. The web application Doctor acts as a client whereas the cloud containing the doctor's details, patient's details and appointment details is maintained by a website that acts as a server.

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APPENDIX

CONCLUSION

In this major goal of this application is to make an online interaction between doctors and patients. Optimize Doctor Expectation Choice Using Cloud Computing meets most of the functionality to manage appointment and prescription for doctors and patients accordingly. Patient can use online appointment to save time and money. This application facilitates the interaction between patient and doctor. The developed system is efficient, effective and interface is very user friendly, Where the Doctor will get previous detail information about the Patient that stored permanently in the database so that if doctor get any problem they can check easily previous prescription of particular patient..

FUTURE ENHANCEMENT

In the future, we plan to upgrade the system and incorporate other functionalities related to Appointment. There is also another scope to make this project into a complete appointment solution . There is also another scope for check the doctor verification in automated. There would also be a information directory about different kinds of medicines. Since health care is a huge sector, there are scopes for possible research in future.

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WEB BASED LOCATION SHARING FOR MOBILE ONLINE SOCIAL NETWORKS USING CLOUD COMPUTING

A PROJECT REPORT

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ABSTRACT

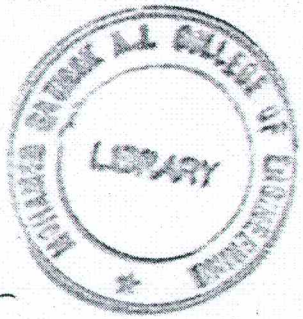
This is an web based project which will play an important role in saving the life of human beings and which is also its main aim developed an website will include all the relevant features to provide a means of communication between blood seekers, blood donors & blood banks. This will help the users in such a way that users can locate different volunteer blood donors and blood banks in their locality through GPS and then request for the blood in case of emergency. The users will be able to view information about different blood banks along with the blood available in their repository, the information of the registers users who need blood in case of emergency and the blood donors who wish to donate blood when required. All the personal information about blood donors will be kept at the backend database. A complete document about the software will be given to the blood bank administration in order to future maintenance of the system. A user manual will be provided to the system administrator with some simple explanations about the system and its features. A simple webpage will be designed for online registration & user guidance & when the donor submits his/her details through the internet a simple guidance will also be given to the donor.

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CHAPTER 6

CONCLUSION AND FUTURE ENHANCEMENTS

In this project, a video anomaly detecting system at traffic and highways that is capable of detecting accidents and also alert the authorities has been developed. The experiment has been performed using MATLAB tool with Android alert module. The experiment includes two accident videos and the system is able to successfully detect the accident. The proposed system can be used for surveillance in various fields for security purposes.The system is going to make use of video anomaly detection algorithms like STAE and AMDN which can detect alteration between frames.The system is made to learn various anomalies using the concept of machine learning.

To improve the performance of the detection and algorithm, problems created by shadows and occlusion is planned to be addressed by using better background modeling techniques and re-segmentation of the segmented vehicle region using average color and lightness distance of blocks in the segmented object regions. The processing speed will be increased in future and the video quality will also be improved.The future system will support unmanned live camera surveillance and monitoring. These systems can be made to send the GPS location of the abnomalous event. And also it is planned to make the object detection and tracking algorithm operate under night conditions. Also it is planned to collect more theft data from different camera angles to make the algorithm robust to various conditions and situations.

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A SECURE IOT-BASED HEALTHCARE SYSTEM WITH MULTI SENSOR NETWORK ANALYSIS

A PROJECT REPORT

Submitted by

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ABSTRACT

This paper presents wireless system which enables real time health monitoring of patient. In healthcare centers, patient's data such as heart rate needs to be constantly monitored using different types of sensors such as heart rate sensor, temperature sensor and vibration sensor. A sensory module is attached which continuously transmits the patient's health status to the database module using web socket. A receiver unit is placed in doctor's cabin which receives the current data on request to the server and previous health record from the database using web socket protocol. Hence, the patient's health status is continuously recorded and which is used for observing and monitoring by the doctor.

Finally, we have evaluated this smart IOT- based system performance in terms of response time and scalability management.

Keywords: Web socket, heart beat sensor, temperature sensor, vibration sensor, response time, IOT- based system.

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APPENDIX C
CONCLUSION AND FUTURE ENHANCEMENT

Big Data Analytics refers to the process that can be used for transforming raw data into meaningful information.This also helps in forming a decision support system for the legislature towards crime detection.Since the population and the crime rates are increasing drastically ,certain steps should be taken in order to maintain law and order.If the number of crimes are found to be increasing in a particular area extra security should be provided.These measures should be carried out so that a sense of safety and awareness can be maintained among the citizens of the country.

Future Work

This analysis can be further carried out by using Apache spark which provides support for structured and semi-structured data.Its processing engine's in-memory computing layer is supposed to run batch-processing programs 100 times faster than MapReduce.

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