III YEAR I SEM

VIGNANA BHARATHI
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19CS3111   COMPUTER NETWORKS

B.Tech III Year I Sem.   **L T   P C**

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Prerequisites:

1. A course on "Programming for problem solving".
2. A course on "Data Structures".

Course Objectives:

1. The objective of the course is to equip the students with a general overview of the conceptsand fundamentals of computer networks.
2. Familiarize the students with the standard models for the layered approach to communicationbetween machines in a network and the protocols of the various layers.
3. Analyze the contents in a given Data Link layer packet, based on the layer concept.
4. Decide routing entries given a simple example of network topology.
5. Analyze the contents in a given Application Layer, based on the layer concept.

Course Outcomes:

1. Gain the knowledge of the basic computer network technology.
2. Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
3. Obtain the skills of subnetting and routing mechanisms.
4. Familiarity with the essential protocols of computer networks, and how they can be applied innetwork design and implementation.
5. Specify and identify deficiencies in existing protocols, and then go onto formulate new and better protocols.

UNIT - I

Network hardware, Network software, OSI, TCP/IP Reference models, Example Networks: ARPANET, Internet. Physical Layer: Guided Transmission media: twisted pairs, coaxial cable, fiber optics, Wirelesstransmission.

UNIT - II

Data link layer: Design issues, framing, Error detection and correction. Elementary data link protocols: simplex protocol, A simplex stop and wait protocol for an error-free channel, A simplex stop and wait protocol for noisy channel. Sliding Window protocols: A one-bit sliding window protocol, A protocol using Go-Back-N, A protocol using Selective Repeat, Example data link protocols.

Medium Access sub layer: The channel allocation problem, Multiple access protocols: ALOHA, Carrier sense multiple access protocols, collision free protocols. Wireless LANs, Data link layer switching.

UNIT - III
Network Layer: Design issues, Routing algorithms: shortest path routing, Flooding, Hierarchical routing, Broadcast, Multicast, distance vector routing, Congestion Control Algorithms, Internetworking, The Network layer in the internet.

UNIT - IV
Transport Layer: Transport Services, Elements of Transport protocols, Connection management, TCPand UDP protocols, Quality of Service.

UNIT - V
Application Layer –Domain name system, SNMP, Electronic Mail; the World Wide Web, HTTP,

TEXT BOOK:
1. Computer Networks -- Andrew S Tanenbaum, David. j. Wetherall, 5th Edition. PearsonEducation/PHI
2. Data Communications and Networking – Behrouz A. Forouzan. Third Edition TMH.

REFERENCE BOOKS:
1. An Engineering Approach to Computer Networks-S. Keshav, 2nd Edition, Pearson Education
2. Data communications and Networks by william stallings

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19DS3112   INTRODUCTION TO DATA SCIENCE

B. Tech III Year I Sem.   **L T P C**

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Prerequisites:

1. Knowledge on Probability and Statistics.
2. Knowledge on Programming languages such as C, Python

Course Objectives:

1. Learn concepts, techniques and tools they need to deal with various facets of data science practice, including data collection and integration.
2. Apply various data science techniques relating to pre-processing, exploring and visualizing data.
3. Understand the basic types of data and basics of R programming.
4. Identify the importance of data reduction and data visualization techniques.
5. Apply statistical and predictive analytical methods to deal with the real time data.

Course Outcomes: After completion of the course, the student should be able to

1. Understand basic terms what Statistical Inference means.
2. Identify probability distributions commonly used as foundations for statistical modelling. Fit amodel to data
3. describe the data using various statistical measures
4. utilize R elements for data handling
5. Perform data reduction and apply visualization techniques.

UNIT - I
Introduction: Definition of Data Science- Big Data and Data Science hype – and getting past the hype- Datafication - Current landscape of perspectives - Statistical Inference - Populations and samples - Statistical modeling, probability distributions, fitting a model – Over fitting.
Basics of R: Introduction, R-Environment Setup, Programming with R, Basic Data Types.

UNIT - II
Data Types & Statistical Description

Types of Data: Attributes and Measurement, What is an Attribute? The Type of an Attribute, The Different Types of Attributes, Describing Attributes by the Number of Values, Asymmetric Attributes, Binary Attribute, Nominal Attributes, Ordinal Attributes, Numeric Attributes, Discrete versus Continuous Attributes. Basic Statistical Descriptions of Data: Measuring the Central Tendency: Mean, Median, and Mode, Measuring the Dispersion of Data: Range, Quartiles, Variance, Standard Deviation, and Inter- quartile Range, Graphic Displays of Basic Statistical Descriptions of Data

UNIT - III

Vectors: Creating and Naming Vectors, Vector Arithmetic, Vector sub setting,

Matrices: Creating andNaming Matrices, Matrix Sub setting, Arrays, Class.

Factors and Data Frames: Introduction to Factors: Factor Levels, Summarizing a Factor, Ordered Factors, Comparing Ordered Factors, Introduction to Data Frame, subsetting of Data Frames, Extending Data Frames, Sorting Data Frames.

Lists: Introduction, creating a List: Creating a Named List, Accessing List Elements, Manipulating ListElements, Merging Lists, Converting Lists to Vectors

UNIT - IV

Conditionals and Control Flow: Relational Operators, Relational Operators and Vectors, Logical Operators, Logical Operators and Vectors, Conditional Statements.

Iterative Programming in R: Introduction, While Loop, For Loop, Looping Over List.
Functions in R: Introduction, writing a Function in R, Nested Functions, Function Scoping, Recursion, Loading an R Package, Mathematical Functionsin R.

UNIT - V

Data Reduction: Overview of Data Reduction Strategies, Wavelet Transforms, Principal Components Analysis, Attribute Subset Selection, Regression and Log-Linear Models: Parametric Data Reduction, Histograms, Clustering, Sampling, Data Cube Aggregation.

Data Visualization: Pixel-Oriented Visualization Techniques, Geometric Projection Visualization Techniques, Icon-Based Visualization Techniques, Hierarchical Visualization Techniques, Visualizing Complex Data and Relations.

TEXT BOOKS:

1. Doing Data Science, Straight Talk from The Frontline. Cathy O'Neil and Rachel Schutt, O'Reilly,2014
2. Jiawei Han, Micheline Kamber and Jian Pei. Data Mining: Concepts and Techniques, 3rd ed.The Morgan Kaufmann Series in Data Management Systems.
3. K G Srinivas, G M Siddesh, "Statistical programming in R", Oxford Publications.

REFERENCE BOOKS:

1. Introduction to Data Mining, Pang-Ning Tan, Vipin Kumar, Michael Steinbanch, PearsonEducation.
2. Brain S. Everitt, "A Handbook of Statistical Analysis Using R", Second Edition, 4 LLC, 2014.
3. Dalgaard, Peter, "Introductory statistics with R", Springer Science & Business Media, 2008.
4. Paul Teetor, "R Cookbook", O'Reilly, 2011.

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19AM3111   DESIGN AND ANALYSIS OF ALGORITHMS

B.Tech III Year I Sem.   **L T   P C**

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Prerequisites:

1. A course on "Computer Programming and Data Structures".
2. A course on "Advanced Data Structures".

Course Objectives:
1. Introduces the notations for analysis of the performance of algorithms.
2. Introduces the data structure disjoint sets.
3. Describes major algorithmic techniques (divide-and-conquer, backtracking, dynamic programming, greedy, branch and bound methods) and mention problems for which each technique is appropriate;
4. Describes how to evaluate and compare different algorithms using worst-, average-, and best-case analysis.
5. Explains the difference between tractable and intractable problems, and introduces the problems that are P, NP and NP complete.

Course Outcomes:
1. Ability to analyze the performance of algorithms. Describe the Divide and Conquer Method. Synthesize Divide and Conquer algorithms and analyze them.
2. Ability to describe about disjoint sets and describe the Backtracking Technique.
3. Describe the dynamic programming paradigm and explain when an algorithmic design situation calls for it. Synthesize dynamic programming algorithms and analyze them.
4. Describes the greedy paradigm and explain when an algorithmic design situation calls for it. Synthesize greedy algorithms and analyze them.
5. Describe the Brand and Bound and differentiate between tractable and intractable problems and to introduce P and NP classes.

UNIT - I
Introduction: Algorithm, Performance Analysis-Space complexity, Time complexity, AsymptoticNotations- Big oh notation, Omega notation, Theta notation and Little oh notation.
Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen'smatrix multiplication.

UNIT - II
Disjoint Sets: Disjoint set operations, union and find algorithms
Backtracking: General method, applications, n-queen's problem, sum of subsets problem, graphcoloring

UNIT - III
Dynamic Programming: General method, applications- Optimal binary search trees, 0/1 knapsackproblem, All pairs shortest path problem, Traveling sales person problem, Reliability design.

UNIT - IV
Greedy method: General method, applications-Job sequencing with deadlines, knapsack problem,Minimum cost spanning trees, Single source shortest path problem.

UNIT - V
Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsackproblem - LC Branch and Bound solution, FIFO Branch and Bound solution.
NP-Hard and NP-Complete problems: Basic concepts, non-deterministic algorithms, NP - Hard andNP-Complete classes, Cook's theorem.

TEXT BOOK:
1.Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharan,University Press.
2."Introduction to Algorithms" by Thomas H. Cormen, Charles E. ...
3."Introduction to Algorithms", by Aho, Hopcroft, Ulman, Pearson Education, 2000.

REFERENCE BOOKS:
1. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.
2. Introduction to Algorithms, second edition, T. H. Cormen, C.E. Leiserson, R. L. Rivest, and C.Stein, PHI Pvt. Ltd./ Pearson Education.
3. Algorithm Design: Foundations, Analysis and Internet Examples, M.T. Goodrich and R. Tamassia, John Wiley and sons.
4. "The Algorithm Design Manual" by Steven S. Skiena. ...
5. "Introduction to the Design and Analysis of Algorithm", by Anany Levitin, Second Edition.
6. Design and Analysis of Algorithms, by S.Sridhar,, Oxford Publications.

19DS3114   DATA MINING

B.Tech III Year I Sem.   **L T P C**

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Pre-Requisites:

1. A course on "Database Management Systems"
2. Knowledge of probability and statistics

Course Objectives:

1. To introduce students to the basic concepts and techniques of Data Mining.
2. To develop skills of using recent data mining software for solving practical problems.
3. To introduce students to learn methods for mining frequent patterns, associations, and correlations.
4. It then describes methods for data classification and prediction, and data–clustering approaches.
5. It covers mining various types of data stores such as spatial, textual, multimedia, streams.

Course Outcomes:

1. Perform the preprocessing of data and apply mining techniques on it.
2. Identify the association rules and extract interesting patterns from large amounts of data.
3. Apply various classification and prediction techniques
4. Able to apply density-based approach to cluster analysis, which can group dense regions of arbitrary shape, such as DBScan
5. Ability to understand, define and characterize the unique aspects of spatial data mining

UNIT - I

Data Mining: Data–Types of Data–, Data Mining Functionalities– Interestingness Patterns– Classification of Data Mining systems– Data mining Task primitives –Integration of Data mining systemwith a Data warehouse–Major issues in Data Mining–Data Preprocessing.

UNIT - II

Association Rule Mining: Mining Frequent Patterns–Associations and correlations – Mining Methods– Mining Various kinds of Association Rules– Correlation Analysis– Constraint based Association mining. Graph Pattern Mining, SPM.

UNIT - III

Classification: Classification and Prediction **–** Basic concepts–Decision tree induction– Bayesian classification, Rule–based classification, Lazy learner.

UNIT - IV

Clustering and Applications: Cluster analysis–Types of Data in Cluster Analysis– Categorization of Major Clustering Methods– Partitioning Methods, Hierarchical Methods– Density–Based Methods, Grid–Based Methods, Outlier Analysis.

UNIT - V

Advanced Concepts: Basic concepts in Mining data streams–Mining Time–series data––Mining sequence patterns in Transactional databases– Mining Object– Spatial– Multimedia–Text and Web data – Spatial Data mining– Multimedia Data mining–Text Mining– Mining the World Wide Web.

TEXT BOOKS:
1. Data Mining – Concepts and Techniques – Jiawei Han & Micheline Kamber, 3rd Edition Elsevier.
2. Data Mining Introductory and Advanced topics – Margaret H Dunham, PEA.

REFERENCE BOOK:
1. Ian H. Witten and Eibe Frank, Data Mining: Practical Machine Learning Tools and Techniques(Second Edition), Morgan Kaufmann, 2005.

19DS3171   DATA WAREHOUSING AND BUSINESS INTELLIGENCE
(Professional Elective – I)

B.Tech III Year I Sem.   **L T P C**

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Course Objectives:

1. Introduce the concepts and components of Business Intelligence (BI)
2. To introduce data warehousing, which consist on OLAP design concepts and multidimensional modeling.
3. Extract, cleanse, consolidated, and transform heterogeneous data into a single enterprise data warehouse.
4. Analyze data to generate information and knowledge that lead to informed decisions for businesses.
5. Use Hadoop and related big data technologies such as Map Reduce, Pig, Hive, and Impala in the context of big data management and problem solving.

Course Outcomes:

1. Students will learn how the steps of the process of data warehousing to automate analytical processes that companies need for their business strategies
2. The learner will be able to design and create a data warehouse from OLAP requirements.
3. Use OLAP tools to import data into multi-dimensional data cubes.
4. Discuss the impact of Business Intelligence (BI) theories, architectures, and methodologies on the organizational decision making process.
5. Comprehension of business analytics and it facilitates in solving business problems in real world environment.

UNIT - I
DATA WAREHOUSE: Data Warehouse-Data Warehouse Architecture- Multidimensional Data Model- Data cube and OLAP Technology-Data Warehouse Implementation -DBMS schemas for Decision support - Efficient methods for Data cube computation.

UNIT - II
Business Intelligence: Introduction – Definition, Leveraging Data and Knowledge for BI, BI Components, BI Dimensions, Information Hierarchy, Business Intelligence and Business Analytics. BI Life Cycle. Data for BI - Data Issues and Data Quality for BI.

UNIT - III
BI Implementation - Key Drivers, Key Performance Indicators and Performance Metrics, BI Architecture/Framework, Best Practices, Business Decision Making, Styles of BI-vent-Driven alerts - A cyclic process of Intelligence Creation. The value of Business Intelligence-Value driven & Information use.

UNIT - IV
Advanced BI – Big Data and BI, Social Networks, Mobile BI, emerging trends, Description of differentBI-Tools (Pentaho, KNIME)

UNIT - V
Business intelligence implementation-Business Intelligence and integration implementation-connectingin BI systems- Issues of legality- Privacy and ethics- Social networking and BI.

TEXT BOOKS:
1. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELINE KAMBER, Elsevier.
2. Rajiv Sabherwal "Business Intelligence" Wiley Publications, 2012.

REFERENCE BOOKS:
1. Efraim Turban, Ramesh Sharda, Jay Aronson, David King, Decision Support and BusinessIntelligence Systems, 9th Edition, Pearson Education, 2009.
2. David Loshin, Business Intelligence - The Savy Manager's Guide Getting Onboard withEmerging IT, Morgan Kaufmann Publishers, 2009.
3. Philo Janus, Stacia Misner, Building Integrated Business Intelligence Solutions with SQLServer, 2008 R2 & Office 2010, TMH, 2011.
4. Business Intelligence Data Mining and Optimization for decision making [Author: Carlo-Verellis][Publication: (Wiley)].
5. Data Warehousing, Data Mining & OLAP- Alex Berson and Stephen J. Smith- Tata McGraw-Hill Edition, Tenth reprint 2007.
6. Building the Data Warehouse- W. H. Inmon, Wiley Dreamtech India Pvt. Ltd.
7. Data Mining Introductory and Advanced topics –MARGARET H DUNHAM, PEA.

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19DS3172   ARTIFICIAL INTELLIGENCE (Professional Elective – I)

B.Tech III Year I Sem.   **L T P C**

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Prerequisites:

1. A course on "Computer Programming and Data Structures"
2. A course on "Design and Analysis of Algorithms"
3. A course on "Mathematical Foundations of Computer Science"
4. Some background in linear algebra, and probability.

Course Objectives:
1. Learn the distinction between optimal reasoning Vs. human like reasoning
2. Understand the concepts of state space representation, exhaustive search, and heuristic search together with the time and space complexities.
3. Learn different knowledge representation techniques.
4. Understand the applications of AI, namely game playing, theorem proving, and machine learning.
5. Know about the various applications of AI.

Course Outcomes:
1. Ability to formulate an efficient problem space for a problem expressed in natural language.

2. Select a search algorithm for a problem and estimate its time and space complexities.

3. Possess the skill for representing knowledge using the appropriate technique for a given problem.

4. Possess the ability to apply AI techniques to solve problems of game playing, and machine learning.

5. Apply AI techniques to real-world problems to develop intelligent systems.

UNIT - I
Problem Solving by Search-I: Introduction to AI, Intelligent Agents
Problem Solving by Search –II: Problem-Solving Agents, Searching for Solutions, Uninformed SearchStrategies: Breadth-first search, Uniform cost search, Depth-first search, Iterative deepening Depth-firstsearch, Bidirectional search, Informed (Heuristic) Search Strategies: Greedy best-first search, A* search, Heuristic Functions, Beyond Classical Search: Hill-climbing search, Simulated annealing search, Local Search in Continuous Spaces, Searching with Non-Deterministic Actions, Searching wihPartial Observations, Online Search Agents and Unknown Environment .

UNIT - II

Problem Solving by Search-II and Propositional Logic

Adversarial Search: Games, Optimal Decisions in Games, Alpha–Beta Pruning, Imperfect Real-TimeDecisions.

Constraint Satisfaction Problems: Defining Constraint Satisfaction Problems, Constraint Propagation, Backtracking Search for CSPs, Local Search for CSPs, The Structure of Problems.

Propositional Logic: Knowledge-Based Agents, The Wumpus World, Logic, Propositional Logic, Propositional Theorem Proving: Inference and proofs, Proof by resolution, Horn clauses and definite clauses, Forward and backward chaining, Effective Propositional Model Checking, Agents Based on Propositional Logic.

UNIT - III

Logic and Knowledge Representation

First-Order Logic: Representation, Syntax and Semantics of First-Order Logic, Using First-Order Logic, Knowledge Engineering in First-Order Logic.

Inference in First-Order Logic: Propositional vs. First-Order Inference, Unification and Lifting, Forward Chaining, Backward Chaining, Resolution.

Knowledge Representation: Ontological Engineering, Categories and Objects, Events. Mental Eventsand Mental Objects, Reasoning Systems for Categories, Reasoning with Default Information.

UNIT - IV

Planning Classical Planning: Definition of Classical Planning, Algorithms for Planning with State-Space Search,Planning Graphs, other Classical Planning Approaches, Analysis of Planning approaches.

Planning and Acting in the Real World: Time, Schedules, and Resources, Hierarchical Planning, Planning and Acting in Nondeterministic Domains, Multi agent Planning.

UNIT - V

Uncertain knowledge and Learning

Uncertainty: Acting under Uncertainty, Basic Probability Notation, Inference Using Full Joint Distributions, Independence, Bayes' Rule and Its Use,

Probabilistic Reasoning: Representing Knowledge in an Uncertain Domain, The Semantics of Bayesian Networks, Efficient Representation of Conditional Distributions, Approximate Inference in Bayesian Networks, Relational and First-Order Probability, Other Approaches to Uncertain Reasoning;Dempster-Shafer theory.

Learning: Forms of Learning, Supervised Learning, Learning Decision Trees. Knowledge in Learning: Logical Formulation of Learning, Knowledge in Learning, Explanation-Based Learning, Learning UsingRelevance Information, Inductive Logic Programming.

TEXT BOOK:

1. Artificial Intelligence A Modern Approach, Third Edition, Stuart Russell and Peter Norvig,Pearson Education.

2. Saroj Kaushik, "Artificial Intelligence", Cengage Learning India, First Edition, 2011.

3. The Logic Of Mind, by R.J. Nelson ,Second Edition.

REFERENCE BOOKS:

1. Artificial Intelligence, 3rd Edn, E. Rich and K. Knight (TMH)
2. Artificial Intelligence, 3rd Edn., Patrick Henny Winston, Pearson Education.
3. Artificial Intelligence, Shivani Goel, Pearson Education.
4. Artificial Intelligence and Expert systems – Patterson, Pearson Education.

19AM3173   WEB PROGRAMMING (Professional Elective – I)

B.Tech III Year I Sem.   **L T P C**

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Course Objectives: The student should be able to:

1. Learn HTML tags and JavaScript language programming concepts and techniques.
2. Know the importance of object-oriented aspects of Scripting.
3. Understand creating database connectivity using JDBC.
4. Learn the concepts of web-based application using sockets.
5. Learn to write,test and debug web pages using HTML and JavaScript.

Course Outcomes: Upon Completion of the course, the students will be able to

1. Design web pages.
2. Use technologies of Web Programming.
3. Apply object-oriented aspects to Scripting.
4. Create databases with connectivity using JDBC.
5. Build 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.

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.

UNIT – III
JDBC: JDBC Overview – JDBC implementation – Connection class – Statements - Catching Database Results, handling database Queries. Networking– Inet Address class – URL class-TCP sockets – UDPsockets, Java Beans –RMI.

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.

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UNIT – V

XML AND WEB SERVICES: Xml – Introduction-Form Navigation-XML Documents-XSL – XSLT- Webservices-UDDI-WSDL-Java web services – Web resources.

TEXT BOOKS:
1. Harvey Deitel, Abbey Deitel, Internet and World Wide Web: How To Program 5th Edition.
2. Herbert Schildt, Java - The Complete Reference, 7th Edition. Tata McGraw- Hill Edition.
3. Michael Morrison XML Unleashed Tech media SAMS.

REFERENCE BOOKS:
1. John Pollock, Java script - A Beginners Guide, 3rd Edition –- Tata McGraw-Hill Edition.
2. Keyur Shah, Gateway to Java Programmer Sun Certification, Tata McGraw Hill, 2002.

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19DS3173 IMAGE PROCESSING (Professional Elective – I)

B.Tech III Year I Sem. **L T P C**

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Pre-requisites:

1. Provide a theoretical and mathematical foundation of fundamental Digital Image Processing concepts
2. Provides the knowledge of image acquisition, sampling and quantization.
3. Preprocessing and enhancement.
4. Image restoration, and segmentation.
5. Knowledge of different image compression techniques.

Course Objectives:

1. Understand the theoretical and mathematical foundations of Digital Image Processing.
2. Explain different image acquisition, sampling and quantization methods;
3. Perform Preprocessing and image enhancement operations on given images.
4. Apply different Image restoration, and segmentation techniques.
5. Perform different image compression techniques.

Course Outcomes:

1. Demonstrate the knowledge of the basic concepts of two-dimensional signal acquisition,sampling, and quantization.
2. Demonstrate the knowledge of filtering techniques.
3. Demonstrate the knowledge of 2D transformation techniques.
4. Demonstrate the knowledge of image enhancement, segmentation, restoration and compression techniques.

UNIT - I
Digital Image Fundamentals: Digital Image through Scanner, Digital Camera. Concept of Gray Levels. Gray Level to Binary Image Conversion. Sampling and Quantization. Relationship between Pixels. Imaging Geometry. 2D Transformations-DFT, DCT, KLT and SVD.

UNIT - II
Image Enhancement in Spatial Domain Point Processing, Histogram Processing, Spatial Filtering,Enhancement in Frequency Domain, Image Smoothing, Image Sharpening.

UNIT - III
Image Restoration Degradation Model, Algebraic Approach to Restoration, Inverse Filtering, LeastMean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT - IV
Image Segmentation Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding,Region Oriented Segmentation.

UNIT - V

Image Compression Redundancies and their Removal Methods, Fidelity Criteria, Image CompressionModels, Source Encoder and Decoder, Error Free Compression, Lossy Compression.

TEXT BOOK:
1. Digital Image Processing: R.C. Gonzalez & R. E. Woods, Addison Wesley/ Pearson Education,2nd Ed, 2004.
2. Fundamentals of Digital Image Processing: A. K. Jain ,PHI.

REFERENCE BOOKS:
1. Fundamentals of Digital Image Processing: A. K. Jain, PHI.
2. Digital Image Processing using MAT LAB: Rafael C. Gonzalez, Richard E. Woods, Steven L.Eddins: Pearson Education India, 2004.
3. Digital Image Processing: William K. Pratt, John Wilely, 3rd Edition, 2004.

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19AM3174   COMPUTER GRAPHICS (Professional Elective – I)

B.Tech III Year I Sem.   **L T P C**

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Prerequisites:

1. Familiarity with the theory and use of coordinate geometry and of linear algebra such asmatrix multiplication.
2. A course on "Computer Programming and Data Structures"

Course Objectives:

1. The computer graphics will give you hands-on experience at developing interactive, real time rendering applications using OpenGL.
2. A major use of computer graphics is in design processes, particularly for engineering and architectural systems, but almost products are now computer designed.
3. To study the fundamental concepts of graphics like line drawings to advanced concepts like rendering, ray tracing to computer animation
4. To Changes in orientation, size and shape are accomplished with geometric transformations that alter the coordinate descriptions objects.
5. To study the visible surface detection methods for identifying visible surfaces and eliminating hidden surfaces.

Course Outcomes:

1. Students will demonstrate an understanding of contemporary graphics hardware and software.
2. Students will create interactive graphics applications in C++ using one or more graphics application programming interfaces.
3. Students will write program functions to implement graphics primitives and demonstrate geometrical transformations.
4. Students will demonstrate an understanding of the use of object hierarchy in graphics applications.
5. Students will write program functions to implement visibility detection Students will write programs that demonstrate computer graphics animation.

UNIT - I

Introduction: Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices. **Output primitives**: Points and lines, line drawing algorithms (Bresenham's and DDA Algorithm), mid-point circle and ellipse algorithms. **Polygon Filling**: Scan-line algorithm, boundary-fill and flood-fill algorithms

UNIT - II

2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. **2-D viewing**: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland algorithms, Sutherland – Hodgeman polygon clipping algorithm.

UNIT - III

3-D object representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

UNIT - IV

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations. **3-D viewing**: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

UNIT - V

Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.
Visible surface detection methods: Classification, back-face detection, depth-buffer, BSP-tree methods and area sub-division methods.

TEXT BOOKS:
1. "Computer Graphics *C version*", Donald Hearn and M. Pauline Baker, Pearson Education
2. "Computer Graphics Principles & practice", second edition in C, Foley, Van Dam, Feiner andHughes, Pearson Education.
3. Computer Graphics, Steven Harrington, TMH

REFERENCE BOOKS:
1. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.
2. Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
3. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.

19DS3174   **SPATIAL AND MULTIMEDIA DATABASES**
(Professional Elective – II)

B.Tech III Year I Sem.   **L T P C**

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Prerequisites:
1. A Course on Database Management Systems
2. A Course on Advanced Data Structures

Course Objective: Introduce the basic concepts, data models and indexing structures for spatial data,multimedia data.

Course Outcomes:
1. Understand data models, storage, indexing and design of spatial databases.
2. Represent image database with R-tree.
3. Store and retrieve multimedia data.

UNIT - I
Introduction to Spatial Databases: Overview, beneficiaries, GIA and SDBMS, users, Space taxonomy,query language, query processing, query optimization. Spatial Concepts and Data Models: Models of Spatial information, three step database design, Extending the ER model with spatial concept, object- oriented data modeling. Spatial Query Languages.

UNIT - II
Spatial Storage and Indexing: Storage-disks and files, spatial indexing, TR*, spatial join index. Query processing and optimization – Evaluation of Spatial operations, query optimization, Analysis of Spatial index structures, distributed and parallel spatial database system. Multidimensional Data Structures: k-d Trees, Point Quadtrees, The MX-Quadtree, R-Trees, comparison of Different Data Structures.

UNIT - III
Image Databases: Raw Images, Compressed Image Representations, Image Processing: Segmentation, Similarity-Based Retrieval, Alternative Image DB Paradigms, Representing Image DBs with Relations, Representing Image DBs with R-Trees, Retrieving Images By Spatial Layout, Implementations. Text/Document Databases: Precision and Recall, Stop Lists, Word Stems, and Frequency Tables, Latent Semantic Indexing, TV-Trees, Other Retrieval Techniques.

UNIT - IV
Video Databases : Organizing Content of a Single Video, Querying Content of Video Libraries, Video Segmentation, video Standards
Audio Databases : A General Model of Audio Data, Capturing Audio Content through Discrete Transformation, Indexing Audio

Data Multimedia Databases : Design and Architecture of a Multimedia Database, Organizing Multimedia Data Based on The Principle of Uniformity, Media Abstractions, Query Languages for Retrieving Multimedia Data, Indexing SMDSs with Enhanced Inverted Indices, Query Relaxation/Expansion.

UNIT - V
Creating Distributed Multimedia Presentations: Objects in Multimedia Presentations, Specifying Multimedia Documents with Temporal Constraints, Efficient Solution of Temporal Presentation Constraints, Spatial Constraints.
Distributed Media Servers: Distributed multimedia server architecture, distributed retrieval plans, optimal distributed retrieval plans.

TEXT BOOKS:
1. Shashi Shekhar, Sanjiv Chawla, Spatial Databases-A Tour, Pearson Education.
2. V.S. Subrahmanian, Principles of Multimedia Database Systems, Morgan Kauffman.

REFERENCE BOOK:
1. Multimedia Databases: An object relational approach, Lynne Dunckley, Pearson Education.
2. Multimedia Database Systems, Prabhakaran, Springer.

19DS3175   **INFORMATION RETRIEVAL SYSTEMS**
(Professional Elective – II)

B.Tech III Year I Sem.   **L T P C**

                                                                 3 - - 3

Prerequisites:

1. A course on Data Structures.

2. A Course on Databases

Course Objectives:
1. To demonstrate genesis and diversity of information retrieval situations for text and hyper media.
2. TO Describe hands-on experience store, and retrieve information from www using semantic approaches
3. Demonstrate the usage of different data/file structures in building computational search engines.
4. To analyze the performance of information retrieval using advanced techniques such as classification, clustering, and filtering over multimedia.
5. To Demonstrate Information visualization technologies like Cognition and perception in the Internet or Web search engine.

Course Outcomes:
1. Understand various functionalities and capabilities of Information Retrieval System.
2. Gain knowledge on cataloging and data structure methodology for IRS.
3. Differentiate various clustering algorithms and indexing.
4. Differentiate various user search techniques and system search techniques.
5. Understand the concepts of information visualization and text search.

UNIT - I
Introduction to Information Retrieval Systems: Definition of Information Retrieval System, Objectives of Information Retrieval Systems, Functional Overview, Relationship to Database Management Systems,Digital Libraries and Data Warehouses
Information Retrieval System Capabilities: Search Capabilities, Browse Capabilities, Miscellaneous Capabilities

UNIT - II
Cataloging and Indexing: History and Objectives of Indexing, Indexing Process, Automatic Indexing, Information Extraction
Data Structure: Introduction to Data Structure, Stemming Algorithms, Inverted File Structure, N-Gram Data Structures, PAT Data Structure, Signature File Structure, Hypertext and XML Data Structures, Hidden Markov Models

UNIT - III

Automatic Indexing: Classes of Automatic Indexing, Statistical Indexing, Natural Language, Concept Indexing, Hypertext Linkages. Document and Term Clustering: Introduction to Clustering, Thesaurus Generation, Item Clustering, Hierarchy of Clusters

UNIT - IV

User Search Techniques: Search Statements and Binding, Similarity Measures and Ranking, Relevance Feedback, Selective Dissemination of Information Search, Weighted Searches of Boolean Systems, Searching the INTERNET and Hypertext
Information Visualization: Introduction to Information Visualization, Cognition and Perception, Information Visualization Technologies

UNIT - V

Text Search Algorithms: Introduction to Text Search Techniques, Software Text Search Algorithms, Hardware Text Search Systems
Multimedia Information Retrieval: Spoken Language Audio Retrieval, Non-Speech Audio Retrieval, Graph Retrieval, Imagery Retrieval, Video Retrieval

TEXT BOOK:
1. Information Storage and Retrieval Systems – Theory and Implementation, Second Edition,Gerald J. Kowalski, Mark T. Maybury, Springer.
2. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.

REFERENCE BOOKS:
1. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms,Prentice Hall, 1992.
2. Information Storage & Retrieval By Robert Korfhage – John Wiley & Sons.
3. Modern Information Retrieval By Yates and Neto Pearson Education.

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19DS3176   **SOFTWARE PROJECT MANAGEMENT**
(Professional Elective – II)

B.Tech III Year I Sem.   **L T P C**

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Prerequisites: A course on "Software Engineering".

Course Objectives
1. Prescribe the conventional and evolution of software.
2. Resolve the process of managing software from conventional to modern.
3. Analyze the architecture of a model based software and the process flow.
4. Describe the process automation, process management and its discriminates.
5. Review the economics for the next generation software.

Course Outcomes
1. Develop the model from the conventional software product to the modern.
2. Analyze and design the software architecture.
3. Have an exposure for organizing and managing a software project.
4. Apply, analyze, design and develop the software project.
5. Design various estimation levels of cost and effort.

UNIT - I
Conventional Software Management: The waterfall model, conventional software Management performance.
Evolution of Software Economics: Software economics, pragmatic software cost estimation.

UNIT - II
Improving Software Economics: Reducing Software product size, improving software processes,improving team effectiveness, improving automation, Achieving required quality, peer inspections.
The old way and the new: The principles of conventional software Engineering, principles of modernsoftware management, transitioning to an iterative process.

UNIT - III
Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.
Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.
Model based software architectures: A Management perspective and technical perspective.
Work Flows of the process: Software process workflows, Iteration workflows.

UNIT - IV

Checkpoints of the process: Major milestones, Minor Milestones, Periodic status assessments. Iterative Process Planning**:** work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning. **Project Organizations and Responsibilities:** Line-of-Business Organizations, Project Organizations, evolution of Organizations.Process Automation**:** Automation building blocks, The Project Environment.

UNIT - V

Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation. Tailoring the Process**:** Process discriminates. **Future Software Project Management:** modern Project Profiles, Next generation Software economics, modern process transitions. **Case Study:** The command Center Processing and Display system-Replacement (CCPDS-R).

TEXT BOOK:
1. Software Project Management, Walker Royce: Pearson Education, 2005.
2. Software Project Management in practice, Pankaj Jalote, Pearson Education. 2005.

REFERENCE BOOKS:
1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management in practice, Pankaj Jalote, Pearson Education. 2005.

19DS3177   **DEVOPS (Professional Elective – II)**

B.Tech III Year I Sem.   **L T P C**

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Course Objectives: The main objectives of this course are to

1. To describe the agile relationship between development and IT operations.
2. To understand the skill sets and high-functioning teams involved in DevOps and related methods to reach a continuous delivery capability.
3. To implement automated system update and DevOps lifecycle.
4. To illustrate the types of version control systems, continuous integration tools, continuous monitoring tools.
5. To analyze the concepts of test automation and deployment automation.

Course Outcomes: On successful completion of this course, students will be able to:

1. Identify components of Devops environment.
2. Describe Software development models and architectures of DevOps.
3. Apply different project management, integration and testing tools.
4. Apply different code deployment tools.
5. Assemble and adopt Devops in real-time projects.

UNIT - I
Introduction: Introduction, Agile development model, DevOps, and ITIL. DevOps process and Continuous Delivery, Release management, Scrum, Kanban, delivery pipeline, bottlenecks, examples

UNIT - II
Software development models and DevOps: DevOps Lifecycle for Business Agility, DevOps, and Continuous Testing.
DevOps influence on Architecture: Introducing software architecture, The monolithic scenario, Architecture rules of thumb, The separation of concerns, Handling database migrations, Microservices,and the data tier, DevOps, architecture, and resilience.

UNIT - III
Introduction to project management: The need for source code control, The history of source code management, Roles and code, source code management system and migrations, Shared authentication, Hosted Git servers, Different Git server implementations, Docker intermission, Gerrit, The pull request model, GitLab.

UNIT - IV
Integrating the system: Build systems, Jenkins build server, Managing build dependencies, Jenkins plugins, and file system layout, The host server, Build slaves, Software on the host, Triggers, Job chaining and build pipelines, Build servers and infrastructure as code, Building by dependency order, Build phases, Alternative build servers, Collating quality measures.

UNIT - V

Testing Tools and automation: Various types of testing, Automation of testing Pros and cons, Selenium - Introduction, Selenium features, JavaScript testing, Testing backend integration points, Test-driven development, REPL-driven development

Deployment of the system: Deployment systems, Virtualization stacks, code execution at the client, Puppet master and agents, Ansible, Deployment tools: Chef, Salt Stack and Docker

TEXT BOOKS:

1. Joakim Verona. Practical Devops, Second Edition. Ingram short title; 2nd edition (2018). ISBN-10: 1788392574
2. Deepak Gaikwad, Viral Thakkar. DevOps Tools from Practitioner's Viewpoint. Wiley publications. ISBN: 9788126579952

REFERENCE BOOK:

1. Len Bass, Ingo Weber, Liming Zhu. DevOps: A Software Architect's Perspective. AddisonWesley; ISBN-10.
2. The Devops Handbook: How to Create World-Class Agility, Reliability, & Security in Technology Organizations; by Gene Kim (Author), Patrick Debois (Author), Professor John Willis (Author), Jez Humble (Author), John Allspaw

19AM3177   COMPUTER VISION AND ROBOTICS
(Professional Elective – II)

B.Tech III Year I Sem.   **L T P C**

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Pre-Requisites:

1. Linear algebra, vector calculus, and probability. ...
2. Data structures
3. Coding that represents images as feature and geometric constructions.
4. Programming knowledge.
5. Image Processing.

Course Objectives:

1. To introduce students the fundamentals of image formation;
2. To introduce students the major ideas, methods, and techniques of computer vision and pattern recognition;
3. To develop an appreciation for various issues in the design of computer vision and object recognition systems
4. To provide the student with programming experience from implementing computer vision and object recognition applications.
5. To Develop and Use software tools for visualizing robots

Course Outcomes:

1. Implement fundamental image processing techniques required for computer vision.
2. Implement boundary tracking techniques.
3. Apply chain codes and other region descriptors, Hough Transform for line, circle, and ellipsedetections.
4. Apply 3D vision techniques and Implement motion related techniques.
5. Develop applications using computer vision techniques.

UNIT - I
CAMERAS: Pinhole Cameras.
Radiometry – Measuring Light: Light in Space, Light Surfaces, Important Special Cases.
Sources, Shadows, And Shading: Qualitative Radiometry, Sources and Their Effects, Local ShadingModels, Application: Photometric Stereo, Interreflections: Global Shading Models.
Color: The Physics of Color, Human Color Perception, Representing Color, A Model for Image Color,Surface Color from Image Color.

UNIT - II
Linear Filters: Linear Filters and Convolution, Shift Invariant Linear Systems, Spatial Frequency andFourier Transforms, Sampling and Aliasing, Filters as Templates.
Edge Detection: Noise, Estimating Derivatives, Detecting Edges.

Texture: Representing Texture, Analysis (and Synthesis) Using Oriented Pyramids, Application:Synthesis by Sampling Local Models, Shape from Texture.

UNIT – III
The Geometry of Multiple Views: Two Views.
Stereopsis: Reconstruction, Human Stereposis, Binocular Fusion, Using More Cameras.
Segmentation by Clustering: What Is Segmentation? Human Vision: Grouping and Getstalt, Applications: Shot Boundary Detection and Background Subtraction, Image Segmentation by Clustering Pixels, Segmentation by Graph-Theoretic Clustering,

UNIT - IV
Segmentation by Fitting a Model: The Hough Transform, Fitting Lines, Fitting Curves, Fitting as aProbabilistic Inference Problem, Robustness
Segmentation and Fitting Using Probabilistic Methods: Missing Data Problems, Fitting, and Segmentation, The EM Algorithm in Practice.
Tracking With Linear Dynamic Models: Tracking as an Abstract Inference Problem, Linear DynamicModels, Kalman Filtering, Data Association, Applications and Examples

UNIT - V
Geometric Camera Models: Elements of Analytical Euclidean Geometry, Camera Parameters and thePerspective Projection, Affine Cameras and Affine Projection Equations.
Geometric Camera Calibration: Least-Squares Parameter Estimation, A Linear Approach to Camera Calibration, Taking Radial Distortion into Account, Analytical Photogrammetry, An Application: Mobile Robot Localization.
Model-Based Vision: Initial Assumptions, Obtaining Hypotheses by Pose Consistency, Obtaining Hypotheses by pose Clustering, Obtaining Hypotheses Using Invariants, Verification, Application: Registration In Medical Imaging Systems, Curved Surfaces and Alignment.

TEXT BOOKS:

1. David A. Forsyth and Jean Ponce: Computer Vision – A Modern Approach, PHI Learning (Indian Edition), 2009.

2. Computer Vision: Models, Learning, and Inference, **by Simon J. D. Prince**

REFERENCE BOOKS:

1. E. R. Davies: Computer and Machine Vision – Theory, Algorithms and Practicalities, Elsevier(Academic Press), 4th edition, 2013.
2. R. C. Gonzalez and R. E. Woods "Digital Image Processing" Addison Wesley 2008.
3. Richard Szeliski "Computer Vision: Algorithms and Applications" Springer-Verlag LondonLimited 2011.

19DS3154   DATA MINING LAB

B.Tech. III Year I Sem.   **L   T   P   C**

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Prerequisites: A course on "Database Management System".

Course Objectives:

1. Learn how to build a data warehouse and query it (using open source tools like Pentaho Data Integration Tool, Pentaho Business Analytics)
2. Learn to perform data mining tasks using a data mining toolkit (such as open source WEKA).
3. Understand the data sets and data preprocessing.
4. Demonstrate the working of algorithms for data mining tasks such association rule mining, classification, clustering and regression.
5. Exercise the data mining techniques with varied input values for different parameters.

Course Outcomes:

1. To evaluate the different models of OLAP and data preprocessing
2. Demonstrate the working of types of schemas and OLAP operations
3. Represent decision tables and trees, classification rules, association rules, rules with exceptions, rules involving relations, and clusters.
4. Demonstrate an understanding of the alternative knowledge representations such as rules, decision trees, decision tables, and Bayesian networks
5. Discuss alternative data mining implementations and what might be most appropriate for a given data mining task.

LIST OF EXPERIMENTS:
Experiments using Weka & Pentaho Tools
1. Data Processing Techniques:
      (i) Data cleaning (ii) Data transformation – Normalization (iii) Data integration
2. Partitioning - Horizontal, Vertical, Round Robin, Hash based
3. Data Warehouse schemas – star, snowflake, fact constellation
4. Data cube construction – OLAP operations
5. Data Extraction, Transformations & Loading operations
6. Application of Attribute oriented induction algorithm
7. Application of apriori algorithm
8. Application on of FP – Growth algorithm
9. Application on of Decision Tree Induction
10. Calculating Information gain measures
11. Classification of data using Bayesian approach

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12. Classification of data using K – nearest neighbour approach
13. Application on K – means algorithm
14. Application on BIRCH algorithm
15. Application on PAM algorithm
16. Application on DBSCAN algorithm

TEXT BOOKS:
1. Data Mining – Concepts and Techniques - JIAWEI HAN &MICHELINE KAMBER, Elsevier.
2. Data Warehousing, Data Mining & OLAP- Alex Berson and Stephen J. Smith- Tata McGraw-Hill Edition, Tenth reprint 2007.

REFERENCE BOOK:
1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Anuj Karpatne, Introduction to Data Mining,Pearson Education.
2. Alex Berson and Stephen J.Smith, ―Data Warehousing, Data Mining & OLAP‖, Tata McGraw – Hill Edition, 35th Reprint 2016.

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19DS3153   **COMPUTER NETWORKS LAB**

B.Tech. III Year I Sem.   **L T P C**

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Course Objectives:

1. To understand the working principle of various communication protocols.
2. To understand the network simulator environment and visualize a network topology and observe its performance
3. To analyze the traffic flow and the contents of protocol frames
4. Implement a simple LAN with hubs, bridges and switches.
5. Design and implement a network protocol.

Course Outcomes:

1. Implement data link layer farming methods
2. Analyze error detection and error correction codes.
3. Implement and analyze routing and congestion issues in network design.
4. Implement Encoding and Decoding techniques used in presentation layer
5. To be able to work with different network tools

List of Experiments

1. Implement the data link layer framing methods such as character, character-stuffing and bitstuffing.
2. Write a program to compute CRC code for the polynomials CRC-12, CRC-16 and CRC CCIP
3. Develop a simple data link layer that performs the flow control using the sliding window protocol,and loss recovery using the Go-Back-N mechanism.
4. Implement Dijsktra's algorithm to compute the shortest path through a network
5. Take an example subnet of hosts and obtain a broadcast tree for the subnet.
6. Implement distance vector routing algorithm for obtaining routing tables at each node.
7. Implement data encryption and data decryption
8. Write a program for congestion control using Leaky bucket algorithm.
9. Write a program for frame sorting techniques used in buffers.
10. Wireshark
    i. Packet Capture Using Wire shark
    ii. Starting Wire shark
    iii. Viewing Captured Traffic
    iv. Analysis and Statistics & Filters.
11. How to run Nmap scan
12. Operating System Detection using Nmap
13. Do the following using NS2 Simulator
    i. NS2 Simulator-Introduction
    ii. Simulate to Find the Number of Packets Dropped
    iii. Simulate to Find the Number of Packets Dropped by TCP/UDP
    iv. Simulate to Find the Number of Packets Dropped due to Congestion

   v. Simulate to Compare Data Rate& Throughput.

   vi. Simulate to Plot Congestion for Different Source/Destination

   vii. Simulate to Determine the Performance with respect to Transmission of Packets

TEXT BOOK:
1. 1. Computer Networks, Andrew S Tanenbaum, David. j. Wetherall, 5th Edition. Pearson Education/PHI.
2. Computer Networking With Internet Protocols And Technology Author: William Stallings

REFERENCE BOOKS:
1. An Engineering Approach to Computer Networks, S. Keshav, 2nd Edition, Pearson Education
2. Data Communications and Networking – Behrouz A. Forouzan. 3rd Edition, TMH.

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19HS3151   ADVANCED ENGLISH COMMUNICATION SKILLS LAB

B.Tech. III Year I Sem.   **L T P C**

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1. INTRODUCTION:

The introduction of the Advanced Communication Skills Lab is considered essential at 3rd year level. At this stage, the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalized context.

The proposed course should be a laboratory course to enable students to use 'good' English and perform the following:

- Gathering ideas and information to organize ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.
- Taking part in social and professional communication.

2. OBJECTIVES:

This Lab focuses on using multi-media instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.
- To prepare all the students for their placements.

3. SYLLABUS:

The following course content to conduct the activities is prescribed for the Advanced English Communication Skills (AECS) Lab:

1. **Activities on Fundamentals of Inter-personal Communication and Building Vocabulary** - Starting a conversation – responding appropriately and relevantly – using the right body language

   – Role Play in different situations & Discourse Skills- using visuals - Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations & usage of vocabulary.

2. **Activities on Reading Comprehension** –General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading& effectivegoogling.

3. **Activities on Writing Skills** – Structure and presentation of different types of writing – *letter writing/Resume writing/ e-correspondence/Technical report writing/* – planning for writing – improving one's writing.

4. **Activities on Presentation Skills** – Oral presentations (individual and group) through JAM sessions/seminars/**PPTs** and written presentations through posters/projects/reports/e-mails/assignments etc.

5. **Activities on Group Discussion and Interview Skills** – Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation- Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference & video-conference and Mock Interviews.

4. MINIMUM REQUIREMENT:

The Advanced English Communication Skills (AECS) Laboratory shall have the following infrastructuralfacilities to accommodate at least 35 students in the lab:

- Spacious room with appropriate acoustics.
- Round Tables with movable chairs
- Audio-visual aids
- LCD Projector
- Public Address system
- P – IV Processor, Hard Disk – 80 GB, RAM–512 MB Minimum, Speed – 2.8 GHZ
- T. V, a digital stereo & Camcorder
- Headphones of High quality

5. SUGGESTED SOFTWARE:

The software consisting of the prescribed topics elaborated above should be procured and used.

- Oxford Advanced Learner's Compass, 7th Edition
- DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dream tech
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)

TEXT BOOKS:

1. Effective Technical Communication by M Asharaf Rizvi. McGraw Hill Education (India) Pvt. Ltd.2nd Edition
2. Academic Writing: A Handbook for International Students by Stephen Bailey, Routledge, 5thEdition.

REFERENCE BOOKS:

1. Learn Correct English – A Book of Grammar, Usage and Composition by Shiv K. Kumar andHemalatha Nagarajan. Pearson 2007
2. Professional Communication by Aruna Koneru, McGraw Hill Education (India) Pvt. Ltd, 2016.
3. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press2009.
4. Technical Communication by Paul V. Anderson. 2007. Cengage Learning pvt. Ltd. New Delhi.
5. English Vocabulary in Use series, Cambridge University Press 2008.
6. Handbook for Technical Communication by David A. McMurrey & Joanne Buckley. 2012.Cengage Learning.
7. Communication Skills by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.
8. Job Hunting by Colm Downes, Cambridge University Press 2008.
9. English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata McGraw-Hill 2009.

19DS3181   SUMMER INTERNSHIP

B.Tech. III Year I Sem.   **L T P C**

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19MC0005   PROFESSIONAL ETHICS

B.Tech. III Year I Sem.   **L T P C**

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Course Objectives
1. To enable the students to imbibe and internalize the Values and Ethical Behaviour in the personal and Professional lives.

Course Outcomes
1. The students will understand the importance of Values and Ethics in their personal lives and professional careers.
2. The students will learn the rights and responsibilities as an employee, team member and a global citizen

UNIT – I
Introduction to Professional Ethics: Basic Concepts, Governing Ethics, Personal &   Professional Ethics, Ethical Dilemmas, Life Skills, Emotional Intelligence, Thoughts of Ethics,   Value Education, Dimensions of Ethics, Profession and professionalism, Professional Associations, Professional Risks, Professional Accountabilities, Professional Success, Ethics and Profession.

UNIT – II
Basic Theories: Basic Ethical Principles, Moral Developments, Deontology, Utilitarianism,Virtue Theory, Rights Theory, Casuist Theory, Moral Absolution, Moral Rationalism, Moral   Pluralism, Ethical Egoism, Feminist Consequentialism, Moral Issues, Moral Dilemmas, Moral Autonomy.

UNIT - III
Professional Practices in Engineering: Professions and Norms of Professional Conduct, Norms of Professional Conduct vs. Profession; Responsibilities, Obligations and Moral Values in Professional Ethics, Professional codes of ethics, the limits of predictability and responsibilities of the engineering profession. Central Responsibilities of Engineers - The Centrality of Responsibilities of Professional Ethics; lessons from 1979 American Airlines DC-10 Crash and Kansas City Hyatt Regency Walk away Collapse.

UNIT – IV
Work Place Rights & Responsibilities, Ethics in changing domains of Research, Engineers and Managers; Organizational Complaint Procedure, difference of Professional Judgment within the Nuclear Regulatory Commission (NRC), the Hanford Nuclear Reservation. Ethics in changing domains of research - The US government wide definition of research misconduct, research misconduct distinguished from mistakes and errors, recent history of attention to research misconduct, the emerging emphasis on understanding and fostering responsible conduct, responsible authorship, reviewing & editing.

UNIT - V

Global issues in Professional Ethics: Introduction – Current Scenario, Technology globalization of MNCs, International Trade, World Summits, Issues, Business Ethics and Corporate Governance, Sustainable Development Ecosystem, Energy Concerns, Ozone Deflection, Pollution, Ethics in Manufacturing and Marketing, Media Ethics; War Ethics; Bio Ethics, Intellectual Property Rights.

TEXT BOOKS:
1. Professional Ethics: R. Subramanian, Oxford University Press, 2015.
2. Ethics in Engineering Practice & Research, Caroline Whitbeck, 2e, Cambridge University Press 2015.

REFERENCES:
1. Engineering Ethics, Concepts Cases: Charles E Harris Jr., Michael S Pritchard, Michael J Rabins, 4e , Cengage learning, 2015.
2. Business Ethics concepts & Cases: Manuel G Velasquez, 6e, PHI, 2008.

III YEAR II SEM

Counselling Code : VBIT

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19DS3211   COMPILER DESIGN

B.Tech III Year II Sem.   **L T P C**

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Prerequisites:

1. A course on "Formal Languages and Automata Theory".
2. A course on "Computer Organization and architecture".
3. A course on "Computer Programming and Data Structures".

Course Objectives:

1. Provide an understanding of the fundamental principles in compiler design.
2. Provide the skills needed for building compilers for various situations that one may encounter in a career in Computer Science.
3. Introduce the major concepts of language translation and impart the knowledge of practical skills necessary for constructing a compiler.
4. Understand phases of compiler, parsing, syntax directed translation, type checking use of symbol tables.
5. Code optimization techniques, intermediate code generation, code generation and data flow analysis.

Course Outcomes:

At the end of course, students must be able to,

1. Demonstrate the ability to design a compiler given a set of language features.
2. Demonstrate the knowledge of patterns, tokens & regular expressions for lexical analysis.
3. Acquire skills in using lex tool & yacc tool for developing a scanner and parser., design and implement LL and LR parsers.
4. Design algorithms to do code optimization in order to improve the performance of a program in terms of space and time complexity.
5. Design algorithms to generate machine code.

UNIT - I

Introduction: The structure of a compiler, the science of building a compiler, programming language basics.
Lexical Analysis: The Role of the Lexical Analyzer, Input Buffering, Recognition of Tokens, The Lexical-Analyzer Generator Lex, Finite Automata, From Regular Expressions to Automata, Design of a Lexical-Analyzer Generator, Optimization of DFA-Based Pattern Matchers.

UNIT - II

Syntax Analysis: Introduction, Context-Free Grammars, Writing a Grammar, Top-Down Parsing, Bottom-Up Parsing, Introduction to LR Parsing: Simple LR, More Powerful LR Parsers, Using Ambiguous Grammars and Parser Generators.

UNIT - III

Syntax-Directed Translation: Syntax-Directed Definitions, Evaluation Orders for SDD's, Applications of Syntax-Directed Translation, Syntax-Directed Translation Schemes, Implementing L-Attributed SDD's.

Intermediate-Code Generation: Variants of Syntax Trees, Three-Address Code, Types and Declarations, Type Checking, Control Flow, Switch-Statements, Intermediate Code for Procedures.

UNIT - IV

Run-Time Environments: Stack Allocation of Space, Access to Nonlocal Data on the Stack, Heap Management, Introduction to Garbage Collection, Introduction to Trace-Based Collection.

Code Generation: Issues in the Design of a Code Generator, The Target Language, Addresses in theTarget Code, Basic Blocks and Flow Graphs, Optimization of Basic Blocks, A Simple Code Generator, Peephole Optimization, Register Allocation and Assignment, Dynamic Programming Code-Generation.

UNIT - V

Machine-Independent Optimization: The Principal Sources of Optimization, Introduction to Data-Flow Analysis, Foundations of Data-Flow Analysis, Constant Propagation, Partial-Redundancy Elimination, Loops in Flow Graphs.

TEXT BOOK:

1. Compilers: Principles, Techniques and Tools, Second Edition, Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffry D. Ullman.
2. "Modern Compiler Implementation in C/Java" by Andrew W Appel

REFERENCE BOOKS:

1. Lex & Yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly
2. Compiler Construction, Louden, Thomson.

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19DS3212   MACHINE LEARNING

B.Tech III Year II Sem.   **L T P C**

                                                                3 - - 3

Prerequisites:

1. Statistics
2. Linear Algebra
3. Calculus
4. Probability
5. Programming Languages and data structures.

Course Objectives:
1. The basic theory underlying machine learning.
2. Machine learning problems corresponding to different applications.
3. A range of machine learning algorithms along with their strengths and weaknesses.
4. Machine learning algorithms to solve problems of moderate complexity.
5. The algorithms to a real-world problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.

Course Outcomes:
1. Appreciate the importance of visualization in the data analytics solution.
2. Apply structured thinking to unstructured problems.
3. Understand a very broad collection of machine learning algorithms and problems.
4. Learn algorithmic topics of machine learning and mathematically deep enough to introduce the required theory.
5. Develop an appreciation for what is involved in learning from data**.**

UNIT - I
Introduction - Well-posed learning problems, designing a learning system, Perspectives and issues in machine learning
Concept learning and the general to specific ordering – introduction, a concept learning task, concept learning as search, find-S: finding a maximally specific hypothesis, version spaces and the candidate elimination algorithm, remarks on version spaces and candidate elimination, inductive bias, Gradient Descent Algorithm and its variants.

UNIT – II
Supervised Learning- Regression: Linear-Simple, Multiple , Logistic Regression.
Classification- Naive Bayes Classifier, k-NN classifier, Support Vector Machines -Linear, Non Linear
Ensemble Techniques I-Decision Trees-ID3(Iterative Dichotomiser3), CART(Classification and Regression Tree)

UNIT – III

Ensemble Techniques II- C4.5, CHAID(Chi-Square Automatic Interaction Detection),Random Forest Algorithm.

Unsupervised Learning-Clustering: Measures of distance, k-means, Gaussian Mixture Model Clustering, Hierarchical Learning- Divisive, Agglomerative Clustering

UNIT- IV

Artificial Neural Networks-1– Introduction, neural network representation, appropriate problems for neural network learning, perceptions, multilayer networks and the back-propagation algorithm.

Artificial Neural Networks-2- Remarks on the Back-Propagation algorithm, An illustrative example: face recognition, advanced topics in artificial neural networks.

UNIT - V

Genetic Algorithms – Motivation, Genetic algorithms, an illustrative example, hypothesis space search, genetic programming, models of evolution and learning, parallelizing genetic algorithms.

Reinforcement Learning – Introduction, the learning task, *Q*–learning, non-deterministic, rewards andactions, temporal difference learning, generalizing from examples, relationship to dynamic programming.

TEXT BOOK:

1. Machine Learning – Tom M. Mitchell, - MGH.
2. Introduction to Machine Learning with Python, **Author –** Andreas C. Müller, Sarah Guido, **Edition –** First Edition, **Publisher –** O'Reilly Media, Inc.

REFERENCE BOOK:

1. Machine Learning: An Algorithmic Perspective, Stephen Marshland, Taylor & Francis.
2. Mathematics for Machine learning, **Author –** Marc Peter Deisenroth, **Edition –** First Edition, **Publisher –** Cambridge University Press.

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19DS3213 BIG DATA ANALYTICS

B.Tech III Year II Sem.   **L T P C**

                                                                                                   3 - - 3

Prerequisites :

1. A Course on Data warehousing

2. Knowledge on Quantitative Aptitude and Statistics

Course Objectives:

1. The purpose of this course is to provide the students with the knowledge of Big data Analyticsprinciples and techniques.
2. This course is also designed to give an exposure of the frontiers of Big data Analytics
3. Provide an overview of Apache Hadoop & HDFS Concepts and Interfacing with HDFS
4. Understand Map Reduce Jobs
5. Exposure to Data Analytics with R.

Courses Outcomes:

1. Ability to explain the foundations, definitions, and challenges of Big Data and various Analytical tools.
2. Demonstrate knowledge of Big Data Analytics concepts and its applications in business
3. Demonstrate functions and components of Map Reduce Framework and HDFS
4. Explain process of developing applications using HBASE, Hive, Pig etc.
5. Apply Machine Learning Techniques using R.

UNIT - I
Introduction to Big Data: Big Data and its Importance – Four V's of Big Data – Drivers for Big Data –Introduction to Big Data Analytics – Big Data Analytics applications.

UNIT - II
Big Data Technologies: Hadoop's Parallel World – Data discovery – Open source technology for Big Data Analytics – cloud and Big Data –Predictive Analytics – Mobile Business Intelligence and Big Data

UNIT - III
Introduction Hadoop: Big Data – Apache Hadoop & Hadoop Eco System – Moving Data in and out ofHadoop – Understanding inputs and outputs of MapReduce - Data Serialization.

UNIT - IV
Hadoop Architecture: Hadoop: RDBMS Vs Hadoop, Hadoop Overview, Hadoop distributors, HDFS, HDFS Daemons, Anatomy of File Write and Read., Name Node, Secondary Name Node, and Data Node, HDFS Architecture, Hadoop Configuration, Map Reduce Framework, Role of HBase in Big Dataprocessing, HIVE, PIG.

UNIT - V

Data Analytics with R Machine Learning: Introduction, Supervised Learning, Unsupervised Learning, Collaborative Filtering, Social Media Analytics, Mobile Analytics, Big Data Analytics with BigR.

TEXT BOOKS:
1. Big Data Analytics, Seema Acharya, Subhasini Chellappan, Wiley 2015.
2. Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Business, Michael Minelli, Michehe Chambers, 1st Edition, Ambiga Dhiraj, Wiely CIO Series, 2013.
3. Hadoop: The Definitive Guide, Tom White, 3rd Edition, O''Reilly Media, 2012.
4. Big Data Analytics: Disruptive Technologies for Changing the Game, Arvind Sathi, 1st Edition, IBM Corporation, 2012.

REFERENCE BOOKS:
1. Big Data and Business Analytics, Jay Liebowitz, Auerbach Publications, CRC press (2013)
2. Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R Enterprise and Oracle R Connector for Hadoop, Tom Plunkett, Mark Hornick, McGraw-Hill/Osborne Media (2013), Oracle press.
3. Professional Hadoop Solutions, Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, Wiley, ISBN: 9788126551071, 2015.
4. Understanding Big data, Chris Eaton, Dirk deroos et al. McGraw Hill, 2012.
5. Intelligent Data Analysis, Michael Berthold, David J. Hand, Springer, 2007.
6. Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with AdvancedAnalytics, Bill Franks, 1st Edition, Wiley and SAS Business Series, 2012.

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19DS3271 **SOFTWARE TESTING METHODOLOGIES**
(Professional Elective – III)

B.Tech III Year II Sem.   **L T P C**

                                                              3 - - 3

Prerequisites: A course on "Software Engineering".

Course Objectives: The objective of this course is to:

1. Learn and understand the tools and techniques of software testing and its practice in the industry.
2. Be aware of the differences between the various testing strategies.
3. Know the taxonomy and purpose of software testing tools.
4. Learn path testing, domain testing.
5. Learn the data flow testing.

Course Outcomes: At the end of the course, students will be able to:

1. Understand the basic concepts of testing, path testing and sensitization2. Generation of test cases from requirements.
2. Learn about the transaction flow testing.
3. Understand the concepts of domain based testing and logic based testing.
4. Describe about the path product and data flow anomaly detection.
5. Understand the concepts of transitions testing.

UNIT - I
Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs. Flow graphs and Path testing: Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT - II
Transaction Flow Testing: transaction flows, transaction flow testing techniques. Dataflow testing: Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing. Domain Testing: domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

UNIT - III
Paths, Path products and Regular expressions: path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection. Logic Based Testing: overview, decision tables, path expressions, kv charts, specifications.

UNIT - IV

State, State Graphs and Transition testing: state graphs, good & bad state graphs, state testing, Testability tips.

UNIT - V

Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. (Student should be given an exposure to a tool like JMeter orWin-runner).

TEXT BOOKS:
1. Software Testing techniques - Baris Beizer, Dreamtech, second edition.
2. Software Testing Tools – Dr. K. V. K. K. Prasad, Dreamtech.

REFERENCE BOOKS:
1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques – SPD(Oreille)
3. Software Testing in the Real World – Edward Kit, Pearson.
4. Effective methods of Software Testing, Perry, John Wiley.
5. Art of Software Testing – Meyers, John Wiley.

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19DS3272   DATA VISUALIZATION TECHNIQUES
(Professional Elective – III)

B.Tech III Year II Sem.   **L   T   P   C**

                                                                                              3   -   -   3

Prerequisites:

1. A course on Computer Graphics.

Course Objective:

1. To learn about different Visualization Techniques
2. To study the Interaction techniques in information visualization fields
3. To understand various abstraction mechanisms
4. To create interactive visual interfaces
5. To learn data modeling and data processing

Course Outcomes:

1. Visualize the objects in different dimensions.
2. Design and process the data for Virtualization.
3. Apply the visualization techniques in physical sciences, computer science, applied mathematicsand medical science.
4. Apply core skills for visual analysis
5. Apply visualization techniques for various data analysis tasks

UNIT - I
Introduction and Data Foundation: Basics - Relationship between Visualization and Other Fields - The Visualization Process - Pseudo code Conventions - The Scatter plot. Data Foundation - Types of Data - Structure within and between Records - Data Preprocessing - Data Sets

UNIT - II
Foundations for Visualization: Visualization stages - Semiology of Graphical Symbols - The Eight Visual Variables - Historical Perspective - Taxonomies - Experimental Semiotics based on Perception Gibson's Affordance theory – A Model of Perceptual Processing.

UNIT - III
Visualization Techniques: Spatial Data: One-Dimensional Data - Two-Dimensional Data – Three- Dimensional Data - Dynamic Data - Combining Techniques.
Geospatial Data: Visualizing Spatial Data- Visualization of Point Data -Visualization of Line Data - Visualization of Area Data - Other Issues in Geospatial Data Visualization
Multivariate Data: Point-Based Techniques - Line- Based Techniques - Region-Based Techniques - Combinations of Techniques – Trees Displaying Hierarchical Structures – Graphics and Networks- Displaying Arbitrary Graphs/Networks.

UNIT - IV

Interaction Concepts and Techniques: Text and Document Visualization: Introduction - Levels of Text Representations - The Vector Space Model - Single Document Visualizations -Document Collection Visualizations - Extended Text Visualizations **Interaction Concepts**: Interaction Operators -Interaction Operands and Spaces - A Unified Framework. **Interaction Techniques**: Screen Space - Object-Space -Data Space -Attribute Space- Data Structure Space - Visualization Structure - AnimatingTransformations -Interaction Control

UNIT - V

Research Directions in Virtualizations: Steps in designing Visualizations – Problems in designing effective Visualizations- Issues of Data. Issues of Cognition, Perception, and Reasoning. Issues of System Design Evaluation, Hardware and Applications.

TEXT BOOKS:

1. Colin Ware "Information Visualization Perception for Design",3 rd edition, morgan Kaufman 2012. (UNIT 1)

2. Stuart.K.Card, Jock.D.Mackinlay and Ben Shneiderman, "Readings in information Visualization Using Vision to think", Morgan Kaufmann Publishers, 1999. (UNIT 3).

3. Thomas Strothotte, "Computer Visualization–Graphics Abstraction and interactivity", Springer Verlag Berlin Heiderberg 1998. (UNIT 2,4,5)

REFERENCE BOOKS

1. Chaomei Chan, "Information Visualization",Beyond the horizon, 2nd edition, Springer Verlag,2004.

2. Pauline Wills, "Visualisation: A Beginner's Guide", Hodder and Stoughlon, 1999.

3. Benedikt. M, "Cyberspace: Firot Steps",MIT Press, 1991.

ONLINE REFERENCES

1. http://www.ornl.gov/info/ornlreview/v30n3-4/visual.htm

2. http://www.silvalifesystem.com/articles/visualization-techniques/www.ulb.tu-darmstadt.de/tocs/5943970X.pdf

3. **http://turing.cs.washington.edu/papers/nips08.pdf**

4. **http://www.barnesandnoble.com/w/computational-visualization-thomas-strothotte/1111486638**

19AM3272 SCRIPTING LANGUAGES

(Professional Elective – III)

B.Tech III Year II Sem.   **L   T   P   C**

                                                                   3   -   -   3

Prerequisites:

1. A course on "Computer Programming and Data Structures".
2. A course on "Object Oriented Programming Concepts".

Course Objectives: The objective of this course is to:

1. Introduce the script programming paradigm.
2. Introduce scripting languages such as Perl, Ruby and TCL.
3. Learn TCL.
4. Assist Perl programmer or database administrator to compile large programming set. Other tasks include implementing complex data structure, compiling object-oriented programming
5. Impart knowledge to students regarding the skills required to write Taylor Control Language (TCL) sequences using fundamental and advanced language features.

Course Outcomes: At the end of this course, students will be able to:

1. Comprehend the differences between typical scripting languages and typical system and application programming languages.
2. Gain knowledge of the strengths and weakness of Perl, TCL and Ruby; and select an appropriate language for solving a given problem.
3. Acquire programming skills in scripting language.
4. Develop, maintain, and scale the performance of web sites using Smarty templates.
5. Develop a platform-independent GUI framework for Tcl named Tk and from a Tcl shell (tclsh),Tk may be invoked using this command: package requires Tk.

UNIT - I

Introduction: Ruby, Rails, The structure and Excution of Ruby Programs, Package Management with RUBYGEMS, Ruby and web: Writing CGI scripts, cookies, Choice of Webservers, SOAP and webservices

RubyTk – Simple Tk Application, widgets, Binding events, Canvas, scrolling.

UNIT - II

Extending Ruby: Ruby Objects in C, the Jukebox extension, Memory allocation, Ruby Type System,Embedding Ruby to Other Languages, Embedding a Ruby Interperter.

UNIT - III

Introduction to PERL and Scripting

Scripts and Programs, Origin of Scripting, Scripting Today, Characteristics of Scripting

Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern andregular expressions, subroutines.

UNIT - IV
Advanced perl Finer points of looping, pack and unpack, file system, eval, data structures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Issues.

UNIT - V
TCL

TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures, strings, patterns, files, Advance TCL- eval, source, exec and uplevel commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface.

Tk

Tk-Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding, Perl-Tk.

TEXT BOOKS:
1. The World of Scripting Languages, David Barron,Wiley Publications.
2. Ruby Progamming language by David Flanagan and Yukihiro Matsumoto O'Reilly
3. "Programming Ruby" The Pramatic Progammers guide by Dabve Thomas Second edition

REFERENCE BOOKS:
1. Open Source Web Development with LAMP using Linux Apache, MySQL, Perl and PHP, J.Lee and B. Ware (Addison Wesley) Pearson Education.
2. Perl by Example, E. Quigley, Pearson Education.
3. Programming Perl, Larry Wall, T. Christiansen and J. Orwant, O'Reilly, SPD.
4. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
5. Perl Power, J. P. Flynt, Cengage Learning.

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19DS3273   **MOBILE APPLICATION DEVELOPMENT**
(Professional Elective – III)

B.Tech III Year II Sem.   **L T P C**

                                                                                  3 - - 3

Prerequisites:

1. Acquaintance with JAVA programming.
2. A Course on DBMS.

Course Objectives: **The Objective of this course is to:**

1. To demonstrate their understanding of the fundamentals of Android operating systems
2. To improves their skills of using Android software development tools
3. To demonstrate their ability to develop software with reasonable complexity on mobile platform
4. To demonstrate their ability to deploy software to mobile devices
5. To demonstrate their ability to debug programs running on mobile devices

Course Outcomes: **At the end of the course, the students will be able to**

1. Student understands the working of Android OS Practically.
2. Student will be able to develop Android user interfaces
3. Understand the use of various Layouts and Widgets in Android Applications.
4. Student will be able to develop, deploy and maintain the Android Applications.
5. Able to develop embedded software for Mobile phones with SQLite.

UNIT - I
Introduction to Android Operating System: Android OS design and Features – Android development framework, SDK features, Installing and running applications on Android Studio, Creating AVDs, Types of Android applications, Best practices in Android programming, Android tools

Android application components – Android Manifest file, Externalizing resources like values, themes, layouts, Menus etc, Resources for different devices and languages, Runtime Configuration Changes Android Application Lifecycle – Activities, Activity lifecycle, activity states, monitoring state changes

UNIT - II
Android User Interface: Measurements – Device and pixel density independent measuring UNIT - s Layouts – Linear, Relative, Grid and Table Layouts

User Interface (UI) Components – Editable and non-editable TextViews, Buttons, Radio and Toggle Buttons, Checkboxes, Spinners, Dialog and pickers

Event Handling – Handling clicks or changes of various UI components

Fragments – Creating fragments, Lifecycle of fragments, Fragment states, Adding fragments to Activity, adding, removing and replacing fragments with fragment transactions, interfacing between fragments and Activities, Multi-screen Activities

UNIT - III

Intents and Broadcasts: Intent – Using intents to launch Activities, Explicitly starting new Activity, Implicit Intents, Passing data to Intents, Getting results from Activities, Native Actions, using Intent to dial a number or to send SMS

Broadcast Receivers – Using Intent filters to service implicit Intents, Resolving Intent filters, finding andusing Intents received within an Activity

Notifications – Creating and Displaying notifications, Displaying Toasts

UNIT - IV

Persistent Storage: Files – Using application specific folders and files, creating files, reading data from files, listing contents of a directory Shared Preferences – Creating shared preferences, saving and retrieving data using Shared Preference

UNIT - V

Database – Introduction to SQLite database, creating and opening a database, creating tables, insertingretrieving and etindelg data, Registering Content Providers, Using content Providers (insert, delete, retrieve and update)

TEXT BOOKS:

1. Professional Android 4 Application Development, Reto Meier, Wiley India, (Wrox), 2012.
2. Android Application Development for Java Programmers, James C Sheusi, Cengage Learning,2013.

REFERENCE BOOK:

1. Beginning Android 4 Application Development, Wei-Meng Lee, Wiley India (Wrox), 2013.

19AM3273 **CRYPTOGRAPHY AND NETWORK SECURITY**
(Professional Elective – III)

B.Tech III Year II Sem.   **L T P C**

                                                                              3 - - 3

Course Objectives:

1. Explain the objectives of information security
2. Explain the importance and application of each of confidentiality, integrity, authentication andavailability
3. Understand various cryptographic algorithms.
4. Understand the basic categories of threats to computers and networks
5. Describe public-key cryptosystem.
6. Describe the enhancements made to IPv4 by IPSec
7. Understand Intrusions and intrusion detection
8. Generate and distribute a PGP key pair and use the PGP package to send an encrypted e-mail message.
9. Discuss Web security and Firewalls

Course Outcomes:

1. Student will be able to understand basic cryptographic algorithms, message and web authentication and security issues.
2. Ability to identify information system requirements for both of them such as client and server.
3. Ability to understand the current legal issues towards information security.
4. Discuss the fundamental ideas of public-key cryptography
5. Discuss Web security and Firewalls

UNIT - I
Security Concepts: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security.
Cryptography Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.

UNIT - II
Symmetric key Ciphers: Block Cipher principles, DES, AES, Blowfish, RC5, IDEA, Block cipher operation, Stream ciphers, RC4.
Asymmetric key Ciphers: Principles of public key cryptosystems, RSA algorithm, Elgamal Cryptography, Diffie-Hellman Key Exchange, Knapsack Algorithm.

UNIT - III

Cryptographic Hash Functions: Message Authentication, Secure Hash Algorithm (SHA-512),

Message authentication codes: Authentication requirements, HMAC, CMAC, Digital signatures, Elgamal Digital Signature Scheme.

Key Management and Distribution: Symmetric Key Distribution Using Symmetric & Asymmetric Encryption, Distribution of Public Keys, Kerberos, X.509 Authentication Service, Public – Key Infrastructure.

UNIT - IV

Transport-level Security: Web security considerations, Secure Socket Layer and Transport Layer Security, HTTPS, Secure Shell (SSH).

Wireless Network Security: Wireless Security, Mobile Device Security, IEEE 802.11 Wireless LAN, IEEE 802.11i Wireless LAN Security.

UNIT - V

E-Mail Security: Pretty Good Privacy, S/MIME **IP Security:** IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, Combining security associations,Internet Key Exchange.

Case Studies on Cryptography and security: Secure Multiparty Calculation, Virtual Elections, Single sign On, Secure Inter-branch Payment Transactions, Cross site Scripting Vulnerability.

TEXT BOOKS:

1. Cryptography and Network Security - Principles and Practice: William Stallings, PearsonEducation, 6th Edition.
2. Cryptography and Network Security: Atul Kahate, Mc Graw Hill, 3rd Edition.

REFERENCE BOOKS:

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, WileyIndia, 1st Edition.
2. Cryptography and Network Security: Forouzan Mukhopadhyay, Mc Graw Hill, 3rd Edition.
3. Information Security, Principles, and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Security: WM. Arthur Conklin, Greg White, TMH.
5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning.
6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning.

OPEN ELECTIVE-1

B.Tech III Year II Sem.   **L T P C**

                                                                       3 - - 3

19DS3252   **MACHINE LEARNING LAB**

B.Tech III Year II Sem.   **L T P C**

                                                                                - - 3 1.5

Course Objective: **The objective of this lab is to**
1. Formulate machine learning problems corresponding to different applications.
2. Apply machine learning algorithms to solve problems of moderate complexity.
3. Apply the algorithms to a real-world problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.
4. Discover patterns in the user data and then make predictions based on these and intricate patterns for answering business questions and solving business problems.
5. Develop skills of using recent machine learning packages for solving practical problems.

Course Outcomes: After the completion of the course the student will be able to:

1. Understand complexity of Machine Learning algorithms and their limitations;
2. *Understand* the mathematical and statistical prospective of machine learning algorithms through python programming.
3. *Design* and evaluate the unsupervised models through python in built functions.
4. **Evaluate** the machine learning models pre-processed through various feature engineering algorithms by python programming.
5. *Design* and *apply* various reinforcement algorithms to solve real time complex problems.

List of Experiments
1. The probability that it is Friday and that a student is absent is 3 %. Since there are 5 school days in a week, the probability that it is Friday is 20 %. What is theprobability that a student is absent given that today is Friday? Apply Baye's rule in python to get the result. (Ans: 15%)

2. Extract the data from database using python

3. Implement k-nearest neighbours classification using python

4. Given the following data, which specify classifications for nine combinations of VAR1 and VAR2 predict a classification for a case where VAR1=0.906 and VAR2=0.606, using the result of kmeans clustering with 3 means (i.e., 3 centroids)

    VAR1 VAR2 CLASS

    1.713 1.586 0

    0.180 1.786 1

    0.353 1.240 1

    0.940 1.566 0

    1.486 0.759 1

1.266 1.106 0

1.540 0.419 1

0.459 1.799 1

0.773 0.186 1

5. The following training examples map descriptions of individuals onto high, medium and low

credit-worthiness.

medium skiing design single twenties no -> highRisk

high golf trading married forties yes -> lowRisk

low speedway transport married thirties yes -> medRisk

medium football banking single thirties yes -> lowRisk

high flying media married fifties yes -> highRisk

low football security single twenties no -> medRisk

medium golf media single thirties yes -> medRisk

medium golf transport married forties yes -> lowRisk

high skiing banking single thirties yes -> highRisk

low golf unemployed married forties yes -> highRisk

Input attributes are (from left to right) income, recreation, job, status, age-group, home-owner. Find the

unconditional probability of `golf' and the conditional probability of `single' given `medRisk' in the

dataset?

6. Implement linear regression using python.

7. Implement Naïve Bayes theorem to classify the English text

8. Implement an algorithm to demonstrate the significance of genetic algorithm

9. Implement the finite words classification system using Back-propagation algorithm

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19DS3253   BIG DATA ANALYTICS LAB

B.Tech III Year II Sem.   **L T P C**

                                                                              - - 3 1.5

Course Objectives:

1. The purpose of this course is to provide the students with the knowledge of Big data Analyticsprinciples and techniques.
2. This course is also designed to give an exposure of the frontiers of Big data Analytics
3. This course is also designed to give an exposure on tools like PIG
4. This course is also designed to give an exposure on the concept of R programming
5. The course is intended to obtain hands-on experience using Cassandra

Course Outcomes:

1. Use Excel as an Analytical tool and visualization tool.
2. Ability to program using HADOOP and Map reduce.
3. Ability to perform data analytics using ML in R.
4. Use cassandra to perform social media analytics.
5. Describe the concept of R programming and implement analytics on Big data using R.

List of Experiments:

1. Implement a simple map-reduce job that builds an inverted index on the set of inputdocuments (Hadoop)
2. Process big data in HBase
3. Store and retrieve data in Pig
4. Perform Social media analysis using cassandra
5. Buyer event analytics using Cassandra on suitable product sales data.
6. Using Power Pivot (Excel) Perform the following on any dataset
   a) Big Data Analytics
   b) Big Data Charting
7. Use R-Project to carry out statistical analysis of big data
8. Use R-Project for data visualization of social media data

TEXT BOOKS:

1. Big Data Analytics, Seema Acharya, Subhashini Chellappan, Wiley 2015.
2. Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Business, Michael Minelli, Michehe Chambers, 1st Edition, Ambiga Dhiraj, Wiely CIO Series, 2013.
3. Hadoop: The Definitive Guide, Tom White, 3rd Edition, O"Reilly Media, 2012.
4. Big Data Analytics: Disruptive Technologies for Changing the Game, Arvind Sathi, 1st Edition, IBM Corporation, 2012.

REFERENCE BOOKS:

1. Big Data and Business Analytics, Jay Liebowitz, Auerbach Publications, CRC press (2013).
2. Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R Enterprise and Oracle R Connector for Hadoop, Tom Plunkett, Mark Hornick, McGraw-Hill/Osborne Media (2013), Oracle press.

3. Professional Hadoop Solutions, Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, Wiley, ISBN: 9788126551071, 2015.
4. Understanding Big data, Chris Eaton, Dirk deroos et al., McGraw Hill, 2012.
5. Intelligent Data Analysis, Michael Berthold, David J. Hand, Springer, 2007.
6. Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with AdvancedAnalytics, Bill Franks, 1st Edition, Wiley and SAS Business Series, 2012.

19DS32P1   **SOFTWARE TESTING METHODOLOGIES LAB**
(Professional Elective – III Lab)

B.Tech III Year II Sem.   **L T P C**

                                                                     -   -   3 1.5

Prerequisites: A basic knowledge of programming.

Course Objectives:
1. To provide knowledge of Software Testing Methods.
2. To develop skills in software test automation and management using latest tools.
3. To provide exposure on testing software and tools.
4. To describe strategies for generating test cases.
5. To describe the principles of system testing.

Course Outcome:
1. Design and develop the best test strategies in accordance to the development model.
2. Understand the need and usage of software tools required for manual and automated testing
3. To design and develop GUI objects.
4. Understand types of testing and characteristics of tool used for test automation.
5. To construct and test simple programs.

List of Experiments:
1. Recording in context sensitive mode and analog mode
2. GUI checkpoint for single property
3. GUI checkpoint for single object/window
4. GUI checkpoint for multiple objects
5. a) Bitmap checkpoint for object/window
   a) Bitmap checkpoint for screen area
6. Database checkpoint for Default check
7. Database checkpoint for custom check
8. Database checkpoint for runtime record check
9. a) Data driven test for dynamic test data submission
   b) Data driven test through flat files
   c) Data driven test through front grids
   d) Data driven test through excel test
10. a) Batch testing without parameter passing
    b) Batch testing with parameter passing
11. Data driven batch
12. Silent mode test execution without any interruption
13. Test case for calculator in windows application

TEXT BOOKS:
1. Software Testing techniques - Baris Beizer, Dreamtech, second edition.
2. Software Testing Tools – Dr. K. V. K. K. Prasad, Dreamtech.

REFERENCE BOOKS:
1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques – SPD(Oreille)
3. Software Testing in the Real World – Edward Kit, Pearson.
4. Effective methods of Software Testing, Perry, John Wiley.
5. Art of Software Testing – Meyers, John Wiley.

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19DS32P2   DATA VISUALIZATION TECHNIQUES LAB
(Professional Elective – III Lab)

B.Tech III Year II Sem.   **L T P C**

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Course Objectives:

1. Understand the various types of data and apply and evaluate the principles of data visualization.
2. Acquire skills to apply visualization techniques to a problem and its associated dataset.
3. To use different visualization tools to unlock the power of data.
4. Develop the visualizations for clusters.
5. To acquire knowledge on time series analysis.

Course Outcomes:

1. Identify the different data types, visualization types to bring out the insight.
2. Relate the visualization towards the problem based on the dataset to analyze and bring outvaluable insight on a large dataset.
3. Demonstrate the analysis of a large dataset using various visualization techniques and tools.
4. Identify the different attributes and showcasing them in plots. Identify and create variousvisualizations for geospatial and table data.
5. Ability to create and interpret plots using R/Python.

List of Experiments:

1. Acquiring and plotting data.
2. Statistical Analysis – such as Multivariate Analysis, PCA, LDA, Correlation regression andanalysis of variance.
3. Financial analysis using Clustering, Histogram and HeatMap.
4. Time-series analysis – stock market.
5. Visualization of various massive dataset - Finance - Healthcare - Census – Geospatial.
6. Visualization on Streaming dataset (Stock market dataset, weather forecasting).
7. Market-Basket Data analysis-visualization.
8. Text visualization using web analytics.

TEXT BOOKS:

1. Matthew Ward, Georges Grinstein and Daniel Keim, "Interactive Data Visualization Foundations, Techniques, Applications", 2010.
2. Colin Ware, "Information Visualization Perception for Design", 2nd edition, Margon KaufmannPublishers, 2004.

REFERENCE BOOKS:

1. Robert Spence "Information visualization – Design for interaction", Pearson Education, 2 ndEdition, 2007.
2. Alexandru C. Telea, "Data Visualization: Principles and Practice," A. K. Peters Ltd, 2008.

19AM32P2 SCRIPTING LANGUAGES LAB
(Professional Elective – III Lab)

B.Tech III Year II Sem.   **L T P C**

                                                                                   - - 3 1.5

Prerequisites: Any High-level programming language(C, C++).

Course Objectives: The objective of this course is to:
1. Understand the concepts of scripting languages for developing web-based projects
2. Help student select programming language and tools suitable for given problem
3. Write simple bash scripts.
4. Understand the applications of Ruby, TCL.
5. Understand the applications of Perl scripting languages.

Course Outcomes: At the end of the course, students will be able to:
1. Understand the differences between Scripting languages and programming languages
2. Acquire some fluency programming in Ruby, Perl, TCL
3. Characterize of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages
4. Learn Fundamentals of TCL, Ruby, TCL
5. Write and apply simple Python programs.

List of Experiments:
1. Write a Ruby script to create a new string which is n copies of a given string where n is a non-negative integer
2. Write a Ruby script which accept the radius of a circle from the user and compute the parameterand area.
3. Write a Ruby script which accept the user's first and last name and print them in reverse orderwith a space between them
4. Write a Ruby script to accept a filename from the user print the extension of that
5. Write a Ruby script to find the greatest of three numbers
6. Write a Ruby script to print odd numbers from 10 to 1
7. Write a Ruby scirpt to check two integers and return true if one of them is 20 otherwise returntheir sum
8. Write a Ruby script to check two temperatures and return true if one is less than 0 and the otheris greater than 100
9. Write a Ruby script to print the elements of a given array
10. Write a Ruby program to retrieve the total marks where subject name and marks of a studentstored in a hash
11. Write a TCL script to find the factorial of a number
12. Write a TCL script that multiplies the numbers from 1 to 10
13. Write a TCL script for Sorting a list using a comparison function

14. Write a TCL script to (i)create a list (ii)append elements to the list (iii)Traverse the list(iv)Concatenate the list
15. Write a TCL script to comparing the file modified times.
16. Write a TCL script to Copy a file and translate to native format.
17. a) Write a Perl script to find the largest number among three numbers.
    b) Write a Perl script to print the multiplication tables from 1-10 using subroutines.
18. Write a Perl program to implement the following list of manipulating functions
    a) Shift
    b) Unshi
    ftc)Push
19. a) Write a Perl script to substitute a word, with another word in a string.
    b) Write a Perl script to validate IP address and email address.
20. Write a Perl script to print the file in reverse order using command line arguments

TEXT BOOKS:
1. The World of Scripting Languages, David Barron,Wiley Publications.
2. Ruby Programming language by David Flanagan and Yukihiro Matsumoto O'Reilly
3. "Programming Ruby" The Pragmatic Programmer's guide by Dabve Thomas Second edition

REFERENCE BOOKS:
1. Open Source Web Development with LAMP using Linux Apache, MySQL, Perl and PHP, J.Leeand B. Ware (Addison Wesley) Pearson Education.
2. Perl by Example, E. Quigley, Pearson Education.
3. Programming Perl, Larry Wall, T. Christiansen and J. Orwant, O'Reilly, SPD.
4. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
5. Perl Power, J. P. Flynt, Cengage Learning.

19DS32P3   MOBILE APPLICATION DEVELOPMENT LAB
(Professional Elective – III Lab)

B.Tech III Year II Sem.   **L   T   P   C**

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Course Objectives:

1. Learn how to develop Applications in android environment.
2. Learn how to develop user interface applications.
3. Learn how to develop URL related applications.
4. Learn Storage Techniques and Animation in Android.
5. Learn how to develop SQLite integration

Course Outcomes:

1. Understand the working of Android OS Practically.
2. Able to develop user interfaces.
3. Able to develop, deploy and maintain the Android Applications.
4. Understand the use of various Layouts and Widgets in Android Applications.
5. Able to Develop Android applications related to mobile related server-less database like SQLITE

List of Experiments:

1. Create an Android application that shows Hello + name of the user and run it on an emulator.
(b) Create an application that takes the name from a text box and shows hello message along with thename entered in text box, when the user clicks the OK button.

2. Create a screen that has input boxes for User Name, Password, Address, Gender (radio buttons formale and female), Age (numeric), Date of Birth (Date Picket), State (Spinner) and a Submit button. Onclicking the submit button, print all the data below the Submit Button. Use (a) Linear Layout (b) RelativeLayout and (c) Grid Layout or Table Layout.

3. Develop an application that shows names as a list and on selecting a name it should show the details of the candidate on the next screen with a "Back" button. If the screen is rotated to landscape mode (width greater than height), then the screen should show list on left fragment and details on right fragment instead of second screen with back button. Use Fragment transactions and Rotation event listener.

4. Develop an application that uses a menu with 3 options for dialing a number, opening a website andto send an SMS. On selecting an option, the appropriate action should be invoked using intents.

5. Develop an application that inserts some notifications into Notification area and whenever a notification is inserted, it should show a toast with details of the notification.

6. Create an application that uses a text file to store user names and passwords (tab separated fields and one record per line). When the user submits a login name and password through a screen, the details should be verified with the text file data and if they match, show a dialog saying that login is successful. Otherwise, show the dialog with Login Failed message.

7. Create a user registration application that stores the user details in a database table.

8. Create a database and a user table where the details of login names and passwords are stored. Insert some names and passwords initially. Now the login details entered by the user should be verifiedwith the database and an appropriate dialog should be shown to the user.

9. Create an admin application for the user table, which shows all records as a list and the admin can select any record for edit or modify. The results should be reflected in the table.

10. Develop an application that shows all contacts of the phone along with details like name, phone number, mobile number etc.

11. Create an application that saves user information like name, age, gender etc. in shared preferenceand retrieves them when the program restarts.

12. Create an alarm that rings every Sunday at 8:00 AM. Modify it to use a time picker to set alarm time.

13. Create an application that shows the given URL (from a text field) in a browser

TEXT BOOKS:
1. Professional Android 4 Application Development, Reto Meier, Wiley India, (Wrox), 2012.
2. Android Application Development for Java Programmers, James C Sheusi, Cengage Learning,2013.

REFERENCE BOOK:
1. Beginning Android 4 Application Development, Wei-Meng Lee, Wiley India (Wrox), 2013.

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19AM32P3   CRYPTOGRAPHY AND NETWORK SECURITY LAB
(Professional Elective – III Lab)

B.Tech III Year II Sem.   **L   T   P   C**

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Course Objectives:

1. Explain the objectives of information security.
2. Explain the importance and application of each of confidentiality, integrity, authentication andavailability.
3. Understand various cryptographic algorithms.

Course Outcomes:

1. Understand basic cryptographic algorithms, message and web authentication and securityissues.
2. Identify information system requirements for both of them such as client and server.
3. Understand the current legal issues towards information security.

List of Experiments:

1. Write a C program that contains a string (char pointer) with a value 'Hello world'. The programshould XOR each character in this string with 0 and displays the result.
2. Write a C program that contains a string (char pointer) with a value 'Hello world'. The programshould AND or and XOR each character in this string with 127 and display the result.
3. Write a Java program to perform encryption and decryption using the following algorithms
    a.   Ceaser cipher b. Substitution cipher c. Hill Cipher
4. Write a C/JAVA program to implement the DES algorithm logic.
5. Write a C/JAVA program to implement the Blowfish algorithm logic.
6. Write a C/JAVA program to implement the Rijndael algorithm logic.
7. Write the RC4 logic in Java Using Java cryptography; encrypt the text "Hello world" usingBlowfish. Create your own key using Java key tool.
8. Write a Java program to implement RSA algorithm.
9. Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript.
10. Calculate the message digest of a text using the SHA-1 algorithm in JAVA.
11. Calculate the message digest of a text using the MD5 algorithm in JAVA.

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TEXT BOOKS:
1. Cryptography and Network Security - Principles and Practice: William Stallings, PearsonEducation, 6th Edition.
2. Cryptography and Network Security: Atul Kahate, McGraw Hill, 3rd Edition.

REFERENCE BOOKS:
1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, WileyIndia, 1st Edition.

2. Cryptography and Network Security: Forouzan Mukhopadhyay, McGraw Hill, 3rd Edition.
3. Information Security, Principles, and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Security: WM. Arthur Conklin, Greg White, TMH.
5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning.
6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning.

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19AMC0002   ENVIRONMENTAL SCIENCE*

B.Tech III Year II Sem.   **L T P C**

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Course Objectives:

- Understanding the importance of ecological balance for sustainable development.
- Understanding the impacts of developmental activities and mitigation measures.
- Understanding the environmental policies and regulations

Course Outcomes:

- Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

UNIT-I

Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity, Field visits.

UNIT-II

Natural Resources: Classification of Resources: Living and Non-Living resources,

water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems.

Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources,

Land resources: Forest resources,

Energy resources: growing energy needs, renewable and non-renewable energy sources, use of alternate energy source, case studies.

UNIT-III

Biodiversity And Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit.

Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; **conservation of biodiversity**: In-Situ and Ex-situ conservation. National Biodiversity act.

UNIT-IV

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, **Air Pollution:** Primary and secondary pollutants, Automobile and Industrial pollution, Ambientair quality standards.

Water pollution: Sources and types of pollution, drinking water quality standards.

Soil Pollution: Sources and types, Impacts of modern agriculture, degradation of soil.

Noise Pollution: Sources and Health hazards, standards,

Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management.

Pollution control technologies: Wastewater Treatment methods: Primary, secondary and Tertiary.Overview of air pollution control technologies, Concepts of bioremediation.

Global Environmental Issues and Global Efforts: Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol, and Montréal Protocol. NAPCC-GoI Initiatives.

UNIT-V

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP).

Towards Sustainable Future: Concept of Sustainable Development Goals, Population and itsexplosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA),Low carbon life style.

TEXT BOOKS:
1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha forUniversity Grants Commission.
2. Environmental Studies by R. Rajagopalan, Oxford University Press.

REFERENCE BOOKS:
1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL LearningPrivate Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHILearning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.

5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
6. Introduction to Environmental Science by Y. Anjaneyulu, BS. Publications.

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19DS3291   **TECHNICAL PAPER PRESENTATION**

B.Tech. III Year II Sem.   **L T P C**

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