SYLLABUS

MANONMANIAM SUNDARANAR UNIVERISTY, TIRUNELVELI-12

PG - COURSES – AFFILIATED COLLEGES

Course Structure for

M.Sc. Computer Science

(Choice Based Credit System)

(with effect from the academic year 2021- 2022 onwards)

Semester-II				
Part	Subject Status	Subject Title	Subject Code	Credit
III	Core- 8	Advanced Web Technology		4
	Core-9	Machine Learning		4
	Core- 10	Advanced DBMS		4
	Core- 11	Cryptography and Network Security		4
	Elective– 1 (Select any one)	1.Free open source Software2.Data Mining3.Data Science and Big Data Analytics		3
	Core - 12 Practical - 3	Advanced Web Technology Lab		2
	Core - 13 Practical - 4	Machine Learning Lab using Python		2

ADVANCED WEB TECHNOLOGY

Course Objectives:

- Explore the backbone of web page creation by developing HTML 5 and XML, Java Scripting, PHP and MySQL skill.
- Enrich knowledge about HTML control and web control classes
- Provide depth knowledge about JS, PHP, MySQL and AJAX
- Understand the need of usability, evaluation methods for web services

Course Outcomes

- Design a web page with Web form fundamentals and web control classes
- Recognize the importance of validation control, cookies and session
- Apply the knowledge of Java Script object, data access and SQL to develop a client server model.
- Recognize the difference between Data list and Data grid controls in accessing data.



UNIT 1:

Web Technologies and HTML

Internet and web Technologies - Client/Server model - Web Search Engine - Web Crawling - Web Indexing - Search Engine Optimization and Limitations - Web Services – Collective Intelligence – Mobile Web – Features of Web 3.0 - HTML vs HTML5 - Exploring Editors and Browsers Supported by HTML5 - New Elements - HTML5 Semantics - Migration from HTML to HTML5 - Canvas - HTML Media - HTML Geolocation - Introduction to CSS3 - CSS2 vs CSS3 - Rounded Corner - Border Images - Multi Background - Gradients - iframe - 2d and 3d transform - Animation.

UNIT - II

XML and AJAX

XML - Documents and Vocabularies-Versions and Declaration -Namespaces JavaScript and XML: Ajax - DOM based XML processing Event - oriented Parsing: SAX -Transforming XML Documents-Selecting XML Data : XPATH-Template based Transformations: XSLT-Displaying XML Documents in Browsers - Evolution of AJAX -Web applications with AJAX -AJAX Framework.

UNIT-III

Client Side Scripting with Java Script

JavaScript Implementation - Use Javascript to interact with some of the new HTML5 apis -Create and modify Javascript objects - JS Forms - Events and Event handling - JS Navigator - JS Cookies - Introduction to JSON - JSON vs XML - JSON Parse - JSON Objects - jQuery Selectors - jQuery HTML&CSS - jQuery DOM - Importance of Angular JS in web - Angular Expression and Directives - AngularJS Data Binding and Controllers -Filters.

UNIT- IV

Server side Scripting with PHP

Essentials of PHP – Installation of Web Server,XAMPP Configurations - PHP Forms - GET and POST method - URL encoding - HTML Encoding - Regular Expressions - Cookies - Sessions - Usage of Include and require statements - File:read and write from the file - PHP Filters - PHP XML Parser - Introduction to Node.js - Node.js Modules and filesystem - Node.js Events.

$\mathbf{UNIT} - \mathbf{V}$

MySQL and MEAN STACK

PHP with MySQL - Performing basic database operation(DML) (Insert, Delete, Update, Select) - Prepared Statement - Uploading Image or File to MySQL - Retrieve Image or File from MySQL - Uploading Multiple Files to MySQL - SQLInjection - Introduction to MEAN and Express.JS - Real time example for modern web applications using MEAN

- 1. Paul Deitel, Harvey Deitel & Abbey Deitel, Internet and World Wide Web: How to Program, Pearson Education, Fifth edition, 2018
- 2. Amos Q.Haviv, MEAN Web Development, Packt Publishing, Second Edition, 2016
- 3. Laura Lemay, Rafe Colburn & Jennifer Kyrnin, Mastering HTML, CSS & Javascript Web Publishing, BPB Publications, First edition, 2016
- 4. Alex Giamas, Mastering Mongo DB 3.x, Packt Publishing Limited, First Edition,



2017

MACHINE LEARNING

Course Objectives:

- To Learn about Machine Intelligence and Machine Learning applications
- To implement and apply machine learning algorithms to real- world applications.
- To identify and apply the appropriate machine learning technique to classification, pattern recognition, optimization and decision problems.
- To understand how to perform evaluation of learning algorithms and model selection.

Course Outcomes

- Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.
- Have an understanding of the strengths and weaknesses of many popular machine learning approaches.
- Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and un-supervised learning.
- Be able to design and implement various machine learning algorithms in a range of real-world applications.

UNIT -1 INTRODUCTION

Learning – Types of Machine Learning – Supervised Learning – The Brain and the Neuron – Linear Discriminants – Perceptron – Linear Separability– Linear Regression.

UNIT - II

LINEAR MODELS

Multi-layer Perceptron – Going Forwards – Going Backwards: Back Propagation Error – Multi-layer Perceptron in Practice – Examples of using the MLP – Overview – Deriving Back-Propagation – Radial Basis Functions and Splines – Concepts – RBF Network – Curse of Dimensionality – Interpolations and Basis Functions – Support Vector Machines

UNIT-III

TREE AND PROBABILISTIC MODELS

Learning with Trees – Decision Trees – Constructing Decision Trees – Classification and Regression Trees – Ensemble Learning – Boosting – Bagging – Different ways to Combine Classifiers – Probability and Learning – Data into Probabilities – Basic Statistics – Gaussian Mixture Models – Nearest Neighbor Methods – Unsupervised Learning – K means Algorithms – Vector Quantization – Self Organizing Feature Map

UNIT- IV

DIMENSIONALITY REDUCTION AND EVOLUTIONARY MODELS

Dimensionality Reduction – Linear Discriminant Analysis – Principal Component Analysis – Factor Analysis – Independent Component Analysis – Locally Linear Embedding – Isomap – Evolutionary Learning – Genetic algorithms – Genetic Offspring: - Genetic Operators – Using Genetic Algorithms – Reinforcement Learning – Overview – Getting Lost Example – Markov Decision Process



UNIT – V GRAPHICAL MODELS

Markov Chain Monte Carlo Methods – Sampling – Proposal Distribution – Markov Chain Monte Carlo – Graphical Models – Bayesian Networks – Markov Random Fields – Hidden Markov Models – Tracking Methods

- 1. Stephen Marsland, —Machine Learning An Algorithmic Perspectivel, Second Edition, Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014.
- 2. Tom M Mitchell, —Machine Learningl, First Edition, McGraw Hill Education, 2013.



ADVANCED DBMS

Course Objectives:

- Acquire broad understanding of database concepts and database management system software and Emerging Trends in it.
- Learn the method of handling distributed and object databases.

Course Outcomes

- Know about the Various Data models and Works on Database Architecture
- Knowledge patterns, Object Oriented Databases are well equipped.

UNIT -1

Database design and the ER model:

Overview – The Entity-Relationship model – Constraints – Removing Redundant Attributes in Entity Sets – Entity Relationship Diagrams-Reduction to relational schemas – Entity Relationship Design Issues – Extended E-R Features. Relational Database Design : Features of good relational Design – Atomic Domains–1NF to 5NF – Denormalization.

UNIT - II

Indexing and Hashing :

Basic Concepts – Ordered Indices – B + Tree Index Files – B + Tree Extensions – Multiple Key Access – Static Hashing – Dynamic Hashing – Comparison of Ordered Indexing and Hashing – Bitmap Indices . Transactions: Transaction Concept – A simple Transaction model – Storage Structure – Transaction Atomicity and Durability – Transaction Isolation – Serializability.

UNIT-III

Concurrency Control :

Lock based Protocols – Deadlock Handling – Multiple Granularity – Timestamp Based Protocols – Validation Based Protocols – Multiversion Schemes – Snapshot Isolation – Insert Operations, Delete Operations and Predicate Reads. Recovery Systems : Failure Classification – Storage – Recovery and Atomicity – Recovery Algorithm – Buffer Management.

UNIT- IV

Database System Architecture :

Centralized and Client Server Architectures – Server System Architectures – Parallel Systems – Distributed Systems. Parallel Databases : Introduction – I/O parallelism – Interquery parallelism – Intraquery parallelism – Intraoperation parallelism – Interoperation parallelism – Query Optimization. Distributed Databases : Homogeneous and Heterogeneous Databases – Distributed Data Storage – Distributed Transactions.

$\mathbf{UNIT} - \mathbf{V}$

Object-Based Databases:

Complex Data Types, Structured Types and Inheritance, Table Inheritance, array and Multiset, Object Identity and Reference Types, Object Oriented versus Object Relational. XML : Motivation-Structure of XML Data- XML document schema-Querying and transformation- Application Program Interfaces to XML –Storage of XML Data- XML Application



- 1. Abraham Silberschatz, Henry F. Korth and S.Sudarshan, "Database System Concepts", Sixth Edition, McGrawHill International Edition, 2011.
- 2. C.J.Date, "Introduction to Database Systems", 8th Edition, Pearson Education, 2003.
- 3. https://spoken-tutorial.org
- 4. Kogent Learning Solutions "Database Management Systems applications" Dreamtech Press, 2014



CRYPTOGRAPHY AND NETWORK SECURITY

Course Objectives:

- To understand security design principles
- To learn secure programming techniques
- To understand the mathematics behind cryptography
- To know the standard algorithms used to provide confidentiality, integrity and authenticity
- To understand the security requirements in operating systems and databases
- To learn about the security applications in wireless environment.

Course Outcomes:

- Illustrate the approaches, trade-offs in security design principles.
- Apply number theory in public key encryption techniques.
- Design a secure operating system
- Discuss the various platform security models in a mobile environment.

UNIT-1

Introduction-Security trends–The OSI security architecture– Security attacks, services and mechanisms– A Model of network security-Security Goals- Cryptographic Attacks— Classical encryption techniques: Symmetric cipher Model-substitution-transposition - steganography- Block cipher and the DES: Block cipher Principles – DES - The strength of DES- Differential and Linear Crypt Analysis-Block Cipher Design Principles.

UNIT – II

Advanced Encryption Standard- AES Cipher-More on Symmetric Ciphers: Block Cipher modes of operation-Stream Cipher and RC4.Public-Key Encryption and Hash Function: Prime Numbers-Testing for Primality - The Chinesh remainder theorem-Public-Key Cryptography and RSA: Principles of Public Key Cryptosystem- The RSA Algorithm-Key Management -Diffie-Hellman Key Exchange- Message Authentication and Hash Function: Authentication Function – Message Authentication Codes-Hash function – HMAC – CMAC - Digital Signature-Authentication Protocol.

UNIT – III

Authentication Applications – Kerberos-x.509AuthenticationService-Public-KeyInfrastructure-Secret Key Algorithm-Security at the Application Layer: Electronic Mail Security-Pretty Good Privacy (PGP)- S/MIME.

$\mathbf{UNIT} - \mathbf{IV}$

IPSecurity

IPSecurity – Overview - IPSecurity - Architecture,-Authentication-Header-Encapsulating Security Payload- Combining Security Associations. Web Security: Web Security Considerations-Secure Socket Layer (SSL) and Transport Layer Security (TLS)-Secure Electronic Transaction (SET).Network Management Security :Basic Concepts of SNMP, SNMPv1, SNMPv3, VPN.

UNIT – V System Security:

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Intruders - Intruders, Intrusion Detection- Password Management-Malware. Malicious Software: Viruses and Related Threats, Virus Countermeasures, Distributed Denial of Service Attacks. Firewalls: Firewall Design Principles, Trusted Systems, Common Criteria for information technology Security Evaluation. Legal and Ethical Issues in Computer Security: Protecting Programs Data-Information and the Law-Redress for Software failures-Selling Correct Software Flaws.

- 1. Stallings William, "Cryptographyand Network Security Principles and Practice2017.
- 2. Behrouz A. Ferouzan, "Cryptography & Network Security", Tata McGraw Hill, 2007, Reprint 2015.
- 3. Charless P.Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Fourth Edition, 2007
- 4. Young Man Rhee, "Internet Security: Cryptographic Principles", "Algorithms And Protocols", Wiley Publications, 2003.
- 5. William Stallings, "Network Security Essentials Applications and Standards" Third Edition, Pearson Education, 2008.
- 6. Charles Pfleeger, "Security In Computing", 4th Edition, Prentice Hall Of India, 2006.
- 7. Ulysess Black, "Internet Security Protocols", Pearson Education Asia, 2000.
- 8. Charlie Kaufman And Radia Perlman, Mike Speciner, "Network Security, Second Edition, Private Communication In Public World", PHI2002.
- 9. Bruce Schneier And Neils Ferguson, "Practical Cryptography", First Edition, Wiley Dreamtech India Pvt Ltd, 2003.
- 10. Douglas R Simson "Cryptography Theory And Practice", First Edition, CRC Press,1995.



Elective – 1 (a) FREE OPEN SOURCE SOFTWARE

Course Objectives:

- To familiarize fundamentals of the shell programming, pipes, input and output redirection Control structures, arithmetic in shell interrupt processing, functions, debugging shell scripts.
- To impart fundamentals of file concepts kernel support for file, File structure related system calls (file API's).
- To teach principles of operating system including File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking Commands, Basic Linux commands, Scripts and filters.
- To know the basics of algorithmic problem solving
- To read and write simple Python programs. To develop Python programs with conditionals and loops.
- To define Python functions and call them.
- To use Python data structures -- lists, tuples, dictionaries

Course Outcomes

- Ability to use various Linux commands that are used to manipulate system operations at admin level and a prerequisite to pursue job as a Network administrator.
- Ability to write Shell Programming using Linux commands.
- Ability to design and write application to manipulate internal kernel level Linux File System.
- Develop algorithmic solutions to simple computational problems Read, write, execute by hand simple Python programs.
- Structure simple Python programs for solving problems.
- Decompose a Python program into functions.

UNIT 1:

INTRODUCTION TO LINUX AND LINUX UTILITIES

A brief history of LINUX - architecture of LINUX - features of LINUX - introduction to vi editor – Basic Linux commands- File handling utilities - Security by file permissions process utilities - disk utilities - networking commands -Text Processing utilities and backup utilities.

UNIT - II

INTRODUCTION TO SHELLS

Linux Session - Standard Streams- Redirection – Pipes - Tee Command - Command Execution – Command Line Editing - Quotes - Command Substitution - Job Control – Aliases - Variables - Predefined Variables – Options - Shell/Environment Customization -Filters: Filters and Pipes - Concatenating files - Display Beginning and End of files - Cut and Paste – Sorting - Translating Characters - Files with Duplicate Lines - Count Characters -Words or Lines - Comparing Files.

UNIT III –

ALGORITHMIC PROBLEM SOLVING IN PYTHON

Algorithms, building blocks of algorithms (statements, state, control flow, functions) -



notation (pseudo code, flow chart, programming language), algorithmic problem solving - simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list-insert acard in a list of sorted cards - guess an integer number in a range - Towers of Hanoi.

UNIT IV-

EXPRESSION, STATEMENTS AND CONTROL STRUCTURES

Python interpreter and interactive mode - values and types - int, float, boolean, string, and list; variables – expressions – statements - tuple assignment - precedence of operators - comments; modules and functions - function definition and use - flow of execution - parameters and arguments;Illustrative programs: exchange the values of two variables, circulate the values of n variables. Conditionals: Boolean values and operators - conditional (if), alternative (if-else), chainedconditional (if-elif-else); Iteration: state, while, for, break, continue, pass.

UNIT V-

FUNCTIONS

Fruitful functions: returnvalues – parameters - local and global scope - function composition - recursion; Strings: string slices - immutability - string functions and methods - string module - Lists as arrays - Illustrative programs:square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.Files, Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, The Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules.

- 1. W. Richard. Stevens (2005), Advanced Programming in the UNIX Environment, 3rd edition, Pearson Education, New Delhi, India.
- 2. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg. Thomson
- 3. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016.
- 4. Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python Revised and updated for Python 3.2, Network Theory Ltd., 2011.
- 5. Charles Dierbach, —Introduction to Computer Science using Python: A Computational Problem-Solving Focus, Wiley India Edition, 2013.
- 6. Gowrishankar S, Veena A, "Introduction to Python Programming", 1st Edition, CRC Press/Taylor & Francis, 2018. ISBN-13: 978-0815394372



DATA MINING

Course Objectives:

- Examine the types of the data to be mined.
- Explore and understand data mining algorithms.

Course Outcomes:

- To evaluate various mining techniques on complex data objects
- To develop applications using Big Data Mining Tools.

UNIT-1

Data Mining and Data Preprocessing:

Data Mining – Motivation – Definition – Data Mining on what Kind of Data – Functionalities – Classification – Data Mining Task Primitives – Major Issues in Data Mining . Data Preprocessing – Definition – Data Cleaning – Integration - Transformation – Data Reduction.

UNIT – II

Data Warehousing:

Definition -Data Warehouse Architecture- Multidimensional Data Model . Frequent Patterns, Associations : Market basket analysis - Association Rule, Support and Confidence -Apriori algorithm - Generating association rule from frequent itemset - Mining frequent item sets without candidate generation (FP- growth) - Overview of multilevel association rule -Multidimensional association rule- - closed item set - maximal item set.

UNIT – III

Definition of Classification and Prediction

Classification by Decision Tree Induction - Bayesian Classification - Rule Based Classification - Classification by Back Propagation - Lazy Learners - K-Nearest Neighbor -Other Classification Methods.

UNIT – IV

Cluster Analysis:

Definition – Types of data in Cluster Analysis – Categorization of major C Lustering Techniques – Partitioning Methods – Hierarchical Clustering – BIRCH - ROCK – Grid Based Methods – Model Based Clustering Methods – Outlier Analysis.

$\mathbf{UNIT} - \mathbf{V}$

Spatial, Multimedia, Text and Web Data: Spatial Data Mining – Multimedia Data Mining – Text Mining – Mining the World Wide Web – Data Mining Applications – Trends in Data Mining. Data mining tool – Orange Tool.

Text and Reference books

- 1. Jiawei Han and Micheline Kambar, "Data Mining Concepts and Technique:", Second Edition, Elsevier, Reprinted 2008.
- 2. Marget H.Dunham, "Data Mining Introductory and Advanced Concepts" Pearson Education 2003.
- 3. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Pearson Education, 2007.

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- 4. G.K.Gupta, "Introduction to Data Mining with Case Studies", 3rd Edition, PHI,2015.
- 5. http://www.celta.parissorbonne.fr/anasem/papers/miscelanea/InteractiveDataMining.pdf





DATA SCIENCE & BIG DATA ANALYTICS

Course Objectives:

- To know the fundamental concepts of big data and analytics.
- To explore tools and practices for working with big data
- To learn about stream computing.
- To know about the research that requires the integration of large amounts of data.

Course Outcomes:

- Upon completion of the course, the students will be able to:
- Work with big data tools and its analysis techniques
- Design efficient algorithms for mining the data from large volumes
- Design an efficient recommendation system
- Design the tools for visualization
- Learn NoSQL databases and management.

UNIT-1

INTRODUCTION

Introduction to Big Data Analytics : Big Data Overview – Data Structures – Analyst Perspective on Data Repositories - State of the Practice in Analytics – BI Versus Data Science - Current Analytical Architecture – Drivers of Big Data – Big Data Ecosystem - Data Analytics Lifecycle – Data Discovery – Data Preparation – Model Planning – Model Building – Communicate Results – Operationalize.

$\mathbf{UNIT} - \mathbf{II}$

DATA ANALYTIC METHODS

Basic Data Analytic Methods Using R : Introduction to R programming – R Graphical User Interfaces – Data Import and Export Attribute and Data Types – Descriptive Statistics Exploratory Data Analysis : Visualization Befor Analysis – Dirty Data – Visualizing a Single Variable – Examining Multiple Variables Data Exploration Versus Presentation – Statistical Methods of Evaluation : Hypothesis Testing – Difference of Means – Wilcoxon Rank-Sum Test – Type I and Type II Errors – Power and Sample Size – ANOVA.

UNIT – III

ADVANCED METHODS

Advanced Analytical Theory and Methods: Clustering – K Means – Use Cases – Overview – Determining number of clusters – Diagnostics Reasons to choose and cautions – Additional Algorithms - Association Rules : A Priori Algorithm – Evaluation of Candidate Rules Applications of Association Rules – Validation and Testing – Diagnostics. Regression: Linear Regression and Logistic Regression: – Use cases – Model Description – Diagnostics -Additional Regression Models.

UNIT – IV

CLASSIFICATION

Classification : Decision Trees – Overview – Genetic Algorithm – Decision Tree Algorithms – Evaluating Decision Tree – Decision Trees in R - Na'ive Bayes – Bayes Theorem – Naïve Bayes Clasifier – Smoothing – Diagnostics – Naïve Bayes in R – Diagnostics of Classifiers – Additional Classification Methods - Time Series Analysis : Overview – Box – Jenkins Methodology – ARIMA Model – Autocorrelation



Function – Autoregressive Models – Moving Average Models – ARMA and ARIMA Models – Building and Evaluating and ARIMA Model - Text Analysis :Text Analysis Steps – Example – Collecting – Representing Term Frequency – Categorizing – Determining Sentiments – Gaining Insights.

UNIT – V TECHNOLOGY

Advanced Analytics-Technology and Tools:MapReduce and Hadoop: Analytics for Unstructured Data -- UseCases - MapReduce - Apache Hadoop -- The Hadoop Ecosystem -pig -- Hive -- Hbase -- Manout -- NoSQL -- Tools in Database Analytics : SQL Essentials --Joins -- Set operations -- Grouping Extensions -- In Database Text Analysis -- Advanced SQL --Windows Functions -- User Defined Functions and Aggregates -- ordered aggregates-MADiib -- Analytics Reports Consolidation -- Communicating and operationalizing and Analytics Project -- Creating the Final Deliverables : Developing Core Material for Multiple Audiences -- Project Goals -- Main Findings -- Approach Model Description -- Key points support with Data -- Model details -- Recommendations -- Data Visualization

- Data Science & Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data", EMC Education Services Published by John Wiley & Sons,
- Noreen Burlingame, "The little book on Big Data", New Street publishers, 2012.
- Anil Maheshwari, "Data Analytics", McGraw Hill Education, 2017.
- David Loshin, "Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph", 2013.
- Bart Baesens, "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications", Wiley Publishers, 2015.
- Dietmar Jannach and Markus Zanker, "Recommender Systems: An Introduction", Cambridge University Press, 2010.
- Kim H. Pries and Robert Dunnigan, "Big Data Analytics: A Practical Guide for Managers " CRC Press, 2015.



ADVANCED WEB TECHNOLOGY LAB

Course Objectives:

- Explore the backbone of web page creation by developing HTML 5 and XML, Java Scripting, PHP and MySQL skill.
- Enrich knowledge about HTML control and web control classes
- Provide depth knowledge about JS, PHP, MySQL and AJAX
- Understand the need of usability, evaluation methods for web services

Course Outcomes:

- Design a web page with Web form fundamentals and web control classes
- Recognize the importance of validation control, cookies and session
- Apply the knowledge of Java Script object, data access and SQL to develop a client server model.
- Recognize the difference between Data list and Data grid controls in accessing data.
- Design a Web application using various technologies such as Java, XML, AJAX, Servlets, PHP, JSP, MySQL and MEAN STACK

LIST OF EXERCISES (Model only, Please add more programmes as per course content)

- 1. Display five different images. Skip two lines between each image. Each image should have a title.
- 2. Print two addresses in the same format used on the front of envelopes (senders address in top left corner, receivers address in the center)
- 3. Create a page with a link at the top of it that when clicked will jump all the way to the bottom of the page. At the bottom of the page there should be a link to jump back to the top of the page.
- 4. CreateWeb Animation with audio using HTML5 & CSS3
- 5. Demonstrate Geolocation and Canvas using HTML5
- 6. Write an XML file and validate using Document Type Definition (DTD)
- 7. Demonstrate DOM and SAX parser
- 8. Write a JavaScript program to demonstrate Form Validation and Event Handling
- 9. Design a simple online test web page in PHP
- 10. Write a JavaScript to implement a web application that lists all cookies stored in the browser on clicking List Cookies" button. Add cookies if necessary
- 11. Create an application using AngularJS
- 12. Demonstrate AngularJS forms and directives
- 13. Demonstrate to fetch the information from an XML file with AJAX
- 14. Implement web application using AJAX with JSON
- 15. Demonstrate Node.js file system module
- 16. Write a PHP program to keep track of the number of visitors visiting the web page and to display this count of visitors, with proper headings
- 17. Implement Database connectivity Mysql with PHP



MACHINE LEARNING LAB USING PYTHON

Course Objectives:

- To apply the concepts of Machine Learning to solve real-world problems
- To implement basic algorithms in clustering & classification applied to text & numeric data
- To implement algorithms emphasizing the importance of bagging & boosting in classification & regression
- To implement algorithms related to dimensionality reduction
- To apply machine learning algorithms for Natural Language Processing applications

Course Outcomes:

- To learn to use Weka tool for implementing machine learning algorithms related to numeric data
- To learn the application of machine learning algorithms for text data
- To use dimensionality reduction algorithms for image processing applications
- To apply CRFs in text processing applications
- To use fundamental and advanced neural network algorithms for solving real-world data

LIST OF EXERCISES RECOMMENDED:

- 1. Solving Regression & Classification using Decision Trees
- 2. Root Node Attribute Selection for Decision Trees using Information Gain
- 3. Bayesian Inference in Gene Expression Analysis
- 4. Pattern Recognition Application using Bayesian Inference
- 5. Bagging in Classification
- 6. Bagging, Boosting applications using Regression Trees
- 7. Data & Text Classification using Neural Networks
- 8. Using Weka tool for SVM classification for chosen domain application
- 9. Data & Text Clustering using K-means algorithm
- 10. Data & Text Clustering using Gaussian Mixture Models
- 11. Dimensionality Reduction Algorithms in Image Processing applications
- 12. Application of CRFs in Natural Language Processing

