VISION OF THE INSTITUTION

To ignite the minds of the students through academic excellence so as to bring about social transformation and prosperity.

MISSION OF THE INSTITUTION

1. To expand the frontiers of knowledge through Quality Education.
2. To provide valued added Research and Development.
3. To embody a spirit of excellence in Teaching, Creativity, Scholarship and Outreach.
4. To provide a platform for synergy of Academy, Industry and Community.
5. To inculcate high standards of Ethical and Professional Behavior.

VISION OF CSE DEPARTMENT

To build a strong teaching-learning base with a flair for innovation and research that responds to the dynamic needs of the software industry and the society.

MISSION OF CSE DEPARTMENT

1. To provide strong foundation both in theory and applications of Computer Science & Engineering, so as to solve real-world problems
2. To empower students with state-of-art knowledge and up to date technological skills, making them globally competent
3. To promote research, innovation and entrepreneurship with focus on industry and social outreach
4. To foster civic minded leadership with ethics and values among students

PROGRAM EDUCATIONAL OBJECTIVES OF CSE DEPARTMENT

1. Graduates will have knowledge of mathematics, science, engineering fundamentals, and in-depth studies in Computer Science Engineering, and will be able to apply them for formulating, analysing and solving real world problems.
2. Graduates will succeed in earning coveted entry level positions in leading Computer Software and Hardware Firms in India and abroad.
3. Graduates will succeed in the pursuit of advanced degrees and research in engineering or other fields and will have skills for continued, independent, lifelong learning and professional development throughout life.
4. Graduates will have good communication skills, leadership qualities, ethical values and will be able to work in teams with due attention to their social responsibilities.

PROGRAM OUTCOMES OF CSE DEPARTMENT

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES OF CSE DEPARTMENT

1. An ability to demonstrate basic knowledge in databases, programming languages and algorithm analysis in the development of software applications.

2. An ability to design and develop projects using open source tools and efficient data structures.

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Year/Semester	I M. Tech/II Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	MEAN STACK TECHNOLOGIES				

Course Objectives:
From the course the student will learn
- Translate user requirements into the overall architecture and implementation of new systems and Manage Project and coordinate with the Client.
- Writing optimized front end code HTML and JavaScript.
- Monitor the performance of web applications & infrastructure and Troubleshooting web application with a fast and accurate a resolution.
- Design and implementation of Robust and Scalable Front End Applications.

Course Outcomes:
After the completion of the course, student will be able to
● Identify the Basic Concepts of Web & Markup Languages.
● Develop web Applications using Scripting Languages & Frameworks.
● Make use of Express JS and Node JS frameworks
● Illustrate the uses of web services concepts like restful, react js.
● Adapt to Deployment Techniques & Working with cloud platform.

UNIT I: Introduction to Web: Internet and World Wide Web, Domain name service, Protocols: HTTP, FTP, SMTP. **Html5** concepts, **CSS3** , Anatomy of a web page. **XML:** Document type Definition, XML schemas, Document object model, XSLT, DOM and SAX Approaches.

UNIT II: JavaScript: The Basic of JavaScript: Objects, Primitives Operations and Expressions, Control Statements, Arrays, Functions, Constructors, Pattern Matching using Regular Expressions.
Angular JS: Angular JS Expressions, ARRAY, Objects, $eval, Strings, AngularJS Form Validation & Form Submission, Single Page Application development using AngularJS

UNIT III: Node.js: Introduction, Advantages, Node.js Process Model, Node JS Modules. **Express.js:** Introduction to Express Framework, Introduction to Nodejs , What is Nodejs, Getting Started with Express, Your first Express App, Express Routing, Implementing MVC in Express, Middleware, Using Template Engines, Error Handling , API Handling , Debugging, Developing Template Engines, Using Process Managers, Security & Deployment.

UNIT IV: RESTful Web Services: Using the Uniform Interface, Designing URIs, Web Linking, Conditional Requests. **React Js:** Welcome to React, Obstacles and Roadblocks, React's Future, Keeping Up with the Changes, Working with the Files, Pure React, Page Setup, TheVirtual DOM, React Elements, ReactDOM, Children, Constructing Elements with Data, React Components, DOM Rendering, Factories

UNIT V: Mongo DB : Introduction, Architecture, Features, Examples, Database Creation & Collection in Mongo DB. Deploying Applications: Web hosting & Domains, Deployment Using Cloud Platforms.

Text Books:

1. Programming the World Wide Web, Robet W Sebesta, 7ed, Pearson.
2. Web Technologies, Uttam K Roy, Oxford
3. Pro Mean Stack Development, ELadElrom, Apress
4. Restful Web Services Cookbook, Subbu Allamraju, O'Reilly
5. JavaScript & jQuery the missing manual, David sawyer mcfarland, O'Reilly
6. Web Hosting for Dummies, Peter Pollock, John Wiley Brand

Reference Books:

1. Ruby on Rails up and Running, Lightning fast Web development, Bruce Tate, Curt Hibbs, Oreilly (2006)
2. Programming Perl, 4ed, Tom Christiansen, Jonathan Orwant, Oreilly (2012)
3. Web Technologies, HTML< JavaScript, PHP, Java, JSP, XML and AJAX, Black book, Dream Tech
4. An Introduction to Web Design, Programming, Paul S Wang, Sanda S Katila, Cengage Learning
5. Express.JS Guide, The Comprehensive Book on Express.js, Azat Mardan, Lean Publishing.

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Year/Semester	I M. Tech/II Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	MACHINE LEARNING				

Course Objectives:

Machine Learning course will
- Develop an appreciation for what is involved in learning from data.
- Demonstrate a wide variety of learning algorithms.
- Demonstrate how to apply a variety of learning algorithms to data.
- Demonstrate how to perform evaluation of learning algorithms and model selection.

Course Outcomes:

After the completion of the course, student will be able to
- Domain Knowledge for Productive use of Machine Learning and Diversity of
Data.
- Demonstrate on Supervised and Computational Learning
- Analyze on Statistics in learning techniques and Logistic
Regression Illustrate on Support Vector Machines and Perception
Algorithm
- Design a Multilayer Perception Networks and classification of decision tree

Unit I: Introduction: Towards Intelligent Machines Well posed Problems, Example of Applications in diverse fields, Data Representation, Domain Knowledge for Productive use of Machine Learning, Diversity of Data: Structured / Unstructured, Forms of Learning, Machine Learning and Data Mining, Basic Linear Algebra in Machine Learning Techniques.

Unit II: Supervised Learning: Rationale and Basics: Learning from Observations, Bias and Variance. Why Learning Works: Computational Learning Theory, Occam's Razor Principle and Overfitting Avoidance Heuristic Search in inductive Learning, Estimating Generalization Errors, Metrics for assessing regression, Metris for assessing classification.

Unit III: Statistical Learning: Machine Learning and Inferential Statistical Analysis, Descriptive Statistics in learning techniques, Bayesian Reasoning: A probabilistic approach to inference, K-Nearest Neighbor Classifier. Discriminant functions and regression functions, Linear Regression with Least Square Error Criterion, Logistic Regression for Classification Tasks, Fisher's Linear Discriminant and Thresholding for Classification, Minimum Description Length Principle.

Unit IV: Support Vector Machines (SVM): Introduction, Linear Discriminant Functions for Binary Classification, Perceptron Algorithm, Linear Maximal Margin Classifier for linearly separable data, Linear Soft Margin Classifier for Overlapping Classes, Kernel Induced Feature Spaces, Nonlinear Classifier, and Regression by Support vector Machines.

Learning with Neural Networks: Towards Cognitive Machine, Neuron Models, Network Architectures, Perceptrons, Linear neuron and the Widrow-Hoff Learning Rule, The error correction delta rule.

Unit V: Multilayer Perceptron Networks and error back propagation algorithm, Radial Basis Functions Networks. **Decision Tree Learning**: Introduction, Example of classification decision

tree, measures of impurity for evaluating splits in decision trees, ID3, C4.5, and CART decision trees, pruning the tree, strengths and weakness of decision tree approach.

Textbooks:
1. Applied Machine Learning,1st edition, M.Gopal, McGraw Hill Education,2018
2. Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis (CRC) 1st Edition-2014

Reference Books:
1. Machine Learning Methods in the Environmental Sciences, Neural Networks, William WHsieh, Cambridge Univ Press. *1* edition (August 31, 2009)
2.   Richard o. Duda, Peter E. Hart and David G. Stork, pattern classification, John Wiley &SonsInc., 2nd Edition-2001

Year/Semester	I M. Tech/II Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	**CLOUD COMPUTING**				

Course Objectives:
☐ To implement Virtualization
☐ To implement Task Scheduling algorithms.
☐ Apply Map-Reduce concept to applications.
☐ To build Private Cloud.
☐ Broadly educate to know the impact of engineering on legal and societal issues involved.

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

☐ Interpret the key dimensions of the challenge of Cloud Computing.
☐ Examine the economics, financial, and technological implications for selecting cloud computing for own organization.
☐ Assessing the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-based applications.
☐ Evaluate own organizations' needs for capacity building and training in cloud computing-related IT areas.
☐ To Illustrate Virtualization for Data-Center Automation.

UNIT I: Introduction: Network centric computing, Network centric content, peer-to –peer systems, cloud computing delivery models and services, Ethical issues, Vulnerabilities, Major challenges for cloud computing. **Parallel and Distributed Systems:** Introduction, architecture, distributed systems, communication protocols, logical clocks, message delivery rules, concurrency, model concurrency with Petri Nets.

UNIT II: Cloud Infrastructure: At Amazon, The Google Perspective, Microsoft Windows Azure, Open Source Software Platforms, Cloud storage diversity, Inter cloud, energy use and ecological impact, responsibility sharing, user experience, Software licensing, **Cloud Computing:** Applications and Paradigms: Challenges for cloud, existing cloud applications and new opportunities, architectural styles, workflows, The Zookeeper, The Map Reduce Program model, HPC on cloud, biological research.

UNIT III: Cloud Resource virtualization: Virtualization, layering and virtualization, virtual machine monitors, virtual machines, virtualization- full and para, performance and security isolation, hardware support for virtualization, Case Study: Xen, vBlades, **Cloud Resource Management and Scheduling**: Policies and Mechanisms, Applications of control theory to task scheduling, Stability of a two-level resource allocation architecture, feedback control based on dynamic thresholds, coordination, resource bundling, scheduling algorithms, fair queuing, start time fair queuing, cloud scheduling subject to deadlines, Scheduling Map Reduce applications, Resource management and dynamic application scaling.

UNIT IV: Storage Systems: Evolution of storage technology, storage models, file systems and database, distributed file systems, general parallel file systems. Google file system. Apache Hadoop, Big Table, Megastore (text book 1), Amazon Simple Storage Service(S3) (Text book 2), **Cloud Security:** Cloud security risks, security – a top concern for cloud users, privacy and privacy impact assessment, trust, OS security, Virtual machine security, Security risks.

UNIT V: Cloud Application Development: Amazon Web Services : EC2 – instances, connecting clients, security rules, launching, usage of S3 in Java, Installing Simple Notification Service on Ubuntu 10.04, Installing Hadoop on Eclipse, Cloud based simulation of a Distributed trust algorithm, Cloud service for adaptive data streaming (Text Book 1), **Google:** Google App Engine, Google Web Toolkit (Text Book 2), **Microsoft:** Azure Services Platform, Windows live, Exchange Online, Share Point Services, Microsoft Dynamics CRM (Text Book 2).

Text Books:
1. Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier
2. Cloud Computing, A Practical Approach, Anthony T Velte, Toby J Velte, Robert Elsenpeter, TMH

Reference book:
1. Mastering Cloud Computing, Foundations and Application Programming, Raj Kumar Buyya, Christen vecctiola, S Tammarai selvi, TMH

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Year/Semester	I M. Tech/II Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	DIGITAL FORENSICS				

UNIT - I

Computer Forensics Fundamentals: What is Computer Forensics? Use of Computer Forensics in Law Enforecement,Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of professional Forensics Methodology, Steps taken by Computer Forensics Specialists.

Types of Computer Forensics Technology: Types of Law Enforcement: Computer Forensic Technology, Types of Business Computer Forensic Technology.

UNIT - II

Computer Forensics Evidence and capture: Data Recovery Defined, Data Back-up and Recovery, The Role of Back -up in Data Recovery, The Data -Recovery Solution.

Evidence Collection and Data Seizure: Why Collect Evidence? Collection Options, Obstacles, Types of Evidence, The Rules of Evidence, Volatile Evidence, General Procedure, Collection and Archiving, Methods of Collections,Artifacts,Collection Steps, Controlling Contamination: The chain of custody.

UNIT - III

Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene, Computer Evidence processing steps, Legal Aspects of collecting and Preserving Computer forensic Evidence.

Computer image Verification and Authentication: Special needs of Evidential Authentication

Network Forensics: Network forensic overview, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honeynet project.

UNIT - IV

E-mail investigations: Exploring the role of email in investigations, exploring the role of client and server in email, investigating email crimes and violations, using specialized email forensic tools.

Processing crime at incident scenes: Collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, Preparing for a search, Securing a Digital incident or crime scene, seizing digital evidence at the scene, Storing digital evidence, obtaining a digital hash, Reviewing a case.

UNIT - V

Current Digital Forensic Tools: Evaluating Digital forensic tool needs, Digital forensic software tools, Digital forensic hardware tools, validating and testing forensic software.

TEXT BOOKS:

1. Computer Forensics, Computer Crime Investigation by John R,Vacca, Firewall Media, New Delhi.

2. Computer Forensics and Investigations by Nelson, Phillips Enfinger, Steuart, CENGAGE Learning.

REFERENCE BOOKS:

1. Real Digital Forensics by Keith j.Jones, Richard Bejitlich,Curtis W.Rose ,AddisonWesley Pearson Education

2. Forensic Compiling,A Tractitioneris Guide by Tony Sammes and Brain Jenkinson,Springer International edition.

3. Computer Evidence Collection &Presentation by Chrostopher L.T. Brown,Firewall Media.

4. Homeland Security ,Techniques& Technologies by Jesus Mena,Firewall Media.

5. Software Forensics Collecting Evidence from the Scene of a Digital Crime by Robert M.Slade ,TMH 2005 6. Windows Forensics by chad Steel,Wiley India Edition

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Year/Semester	I M. Tech/II Sem	L	T	P	C
Regulation Year	2020-21	0	0	4	2
Subject	**MEAN STACK TECHNOLOGIES LAB**				

Course Objectives:
From the course the student will
● Learn the core concepts of both the frontend and backend programming course.
● Get familiar with the latest web development technologies.
● Learn all about SQL and Mongo databases.
● Learn the complete web development process.

Course Outcomes:
At the end of the course, student will be able to
● Identify the Basic Concepts of Web & Markup Languages.
● Develop web Applications using Scripting Languages & Frameworks.
● Creating & Running Applications using JSP libraries.
● Creating Our First Controller Working with and Displaying in Angular Js and Nested
Forms with ngform.
● Working with the Files in React JS and Constructing Elements with Data.

Experiment-1:
Develop static pages (using only HTML) of an online Book store. The pages should
resemble: www.amazon.com. The website should consist of the following pages. Home page
● Registration and user Login
● User profile page
● Books catalog
● Shopping cart
● Payment by credit card Order Confirmation

Experiment-2:
Write an HTML page including any required JavaScript that takes a number from a text field
in the range of 0 to 999 and shows it in words. It should not accept four and above digits,
alphabets and special characters.

Experiment-3:
Develop and demonstrate JavaScript with POP-UP boxes and functions for the following
problems:
1. Input: Click on Display Date button using on click ( ) function Output: Display date in the
textbox
2. Input: A number n obtained using prompt Output: Factorial of n number using alert
3. Input: A number n obtained using prompt Output: A multiplication table of numbers from
1 to 10 of n using alert

4. Input: A number n obtained using prompt and add another number using confirm Output: Sum of the entire n numbers using alert

Experiment-4:
Create a simple visual bean with an area filled with a color. The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false. The color of the area should be changed dynamically for every mouse click.

Experiment-5:
Create an XML document that contains 10 users' information. Write a Java Program, which takes User Id as input and returns the user details by taking the user information from XML document using DOM parser or SAX parser

Experiment-6:
Implement the following in BootStrap
1. Implementation in colors, border padding.
2. Implementation button frames tables, navigation bars.

Experiment-7:
Implement the web applications with Database using
1. Servlets
2. JSP.

Experiment-8:
Write a program to design a simple calculator using
1. JavaScript
2. Servlet
3. JSP.

Experiment-9:
Create registration and login forms with validations using JQuery.

Experiment-10:
Write JS Application to authenticate users using firebase database and change profile picture of the user in edit profile tab.

Experiment-11:
Implement the following in React JS
1. Using React Js creating constructs data elements.
2. Using React Js implementations DoM.

Experiment-12:
Implement the following in AngularJS
1. AngularJS data binding.
2. AngularJS directives and Events.
3. Using angular Js fetching data from MySQL.

Experiment-13:
Develop and demonstrate Invoking data using Javascript from MongoDB.

Experiment-14:
Create an Online fee payment form using Javascript and MangoDB.

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Year/Semester	I M. Tech/II Sem	L	T	P	C
Regulation Year	2020-21	0	0	4	2
Subject	**MACHINE LEARNING LAB**				

Experiment-1:
Write a program to solve the following Machine Learning Methods

  (a) Linear Regression
  (b) Logistic Regression

Experiment-2:
Write a program to implement Support Vector Machine.

Experiment-3:
Write a program to simulate perception network for pattern classification and function approximation.

Experiment-4:
Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use appropriate dataset for loading the decision tree and apply know less to classify a new sample.

Experiment-5:
Build an artificial neural network by implementing the basic propagation algorithm and use the same for appropriate dataset.

Experiment-6:
Assuming a set of documents that need to be classified, use the naive Bayesian classifier model to perform this task. Built-in java class /API can be used to write the program calculate the accuracy, precision values of dataset.

Experiment-7:
Write a program to implement K-nearest neighbour algorithm to classify the iris dataset.