

## **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.



VISHNU INSTITUTE OF TECHNOLOGY: BHIMAVARAM(AUTONOMOUS)  
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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

**Course Objectives:**

At the end of the course, the students will be expected to:

- Learn deep learning methods for working with sequential data
- Learn deep recurrent and memory neural networks
- Apply deep learning mechanisms to various learning problems
- Know the open issues in deep learning, and have a grasp of the current research directions

**Course Outcomes:**

After the completion of the course, student will be able to

- Demonstrate the basic concepts of fundamental learning techniques and layers
- Discuss the Neural Network training, various random models
- Explain different types of deep learning network models
- Classify the Probabilistic Neural Networks
- Implement tools on Deep Learning techniques

**UNIT I:**

**Introduction:** Various paradigms of learning problems, Perspectives and Issues in deep learning framework, review of fundamental learning techniques. Feed forward neural network: Artificial Neural Network, activation function, multi-layer neural network.

**UNIT II:**

**Training Neural Network:** Risk minimization, loss function, back propagation, regularization, model selection, and optimization.

**Conditional Random Fields:** Linear chain, partition function, Markov network, Belief propagation, Training CRFs, Hidden Markov Model, Entropy.

**UNIT III:**

**Deep Learning:** Deep Feed Forward network, regularizations, training deep models, dropouts, Convolution Neural Network, Recurrent Neural Network, and Deep Belief Network.

**UNIT IV:**

**Probabilistic Neural Network:** Structured probabilistic models for deep learning. Boltzmann machine, RBMs, **Auto encoders** – Regularized autoencoders, Stochastic Encoders and Decoders, Denoising, Applications.

**UNIT V:**

**Applications:** Object recognition, sparse coding, computer vision, natural language processing.  
**Introduction to Deep Learning Tools:** Keras, Torch.

**Text Books:**

1. Goodfellow, I., Bengio, Y., and Courville, A., Deep Learning, MIT Press, 2016..
2. Bishop, C. ,M., Pattern Recognition and Machine Learning, Springer, 2006.

**Reference Books:**

1. Artificial Neural Networks, Yegnanarayana, B., PHI Learning Pvt. Ltd, 2009.
2. Matrix Computations, Golub, G.,H., and Van Loan,C.,F, JHU Press,2013.
3. Neural Networks: A Classroom Approach, Satish Kumar, Tata McGraw-Hill Education, 2004.



VISHNU INSTITUTE OF TECHNOLOGY: BHIMAVARAM(AUTONOMOUS)  
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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

**Course Objectives:**

- Architect sensor networks for various application setups.
- Devise appropriate data dissemination protocols and model links cost.
- Understandings of the fundamental concepts of wireless sensor networks and have a basic knowledge of the various protocols at various layers
- Evaluate the performance of sensor networks and identify bottlenecks

**Course Outcomes:**

After the completion of the course, student will be able to

- Explain the Fundamental Concepts and applications of ad hoc and wireless sensor networks
- Discuss the MAC protocol issues of ad hoc networks
- Enumerate the concept of routing protocols for ad hoc wireless networks with respect to TCP design issues
- Analyze & Specify the concepts of network architecture and MAC layer protocol for WSN
- Discuss the WSN routing issues by considering QoS measurements

**UNIT I:**

**Introduction :** Fundamentals of Wireless Communication Technology, The Electromagnetic Spectrum, Radio propagation Mechanisms ,Characteristics of the Wireless channel ,**Mobile ad hoc networks (MANETs) and Wireless Sensor Networks (WSNs):** concepts and architectures, Applications of Ad Hoc and Sensor Networks, Design Challenges in Ad hoc and Sensor Networks.

**UNIT II:**

**MAC Protocols For Ad Hoc Wireless Networks:** Issues in designing a MAC Protocol, Issues in Designing a MAC Protocol for Ad Hoc Wireless Networks, Design Goals of a MAC Protocol for Ad Hoc Wireless Networks, Classification of MAC Protocols, Contention based protocols, Contention based protocols with Reservation Mechanisms, Contention based protocols with Scheduling Mechanisms, Multi channel MAC - IEEE 802.11.

**UNIT III:**

**Routing Protocols And Transport Layer In Ad Hoc Wireless Networks:** Routing Protocol: Issues in designing a routing protocol for Ad hoc networks, Classification, proactive routing, reactive routing (on-demand), hybrid routing, Transport Layer protocol for Ad hoc networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer solutions TCP over Ad hoc wireless, Network Security, Security in Ad Hoc Wireless Networks, Network Security Requirements.

**UNIT IV:**

**Wireless Sensor Networks (WSNS) And Mac Protocols:** Single node architecture - hardware and software components of a sensor node, **WSN Network architecture:** typical

network architectures, data relaying and aggregation strategies, **MAC layer protocols:** selforganizing, Hybrid TDMA/FDMA and CSMA based MAC -IEEE 802.15.4.

#### **UNIT V:**

**WSN Routing, Localization & Qos:** Issues in WSN routing, OLSR, Localization, Indoor and Sensor Network Localization, absolute and relative localization, triangulation, QOS in WSN, Energy Efficient Design, Synchronization.

#### **Text Books:**

1. "Ad Hoc Wireless Networks: Architectures and Protocols ", C. Siva Ram Murthy, and B. S. Manoj, Pearson Education, 2008
2. "Wireless Adhoc and Sensor Networks", Labiod. H, Wiley, 2008
3. "Wireless ad-hoc and sensor Networks: theory and applications", Li, X, Cambridge University Press, 2008.

#### **Reference Books:**

1. "Ad Hoc & Sensor Networks: Theory and Applications", 2nd edition, Carlos De Morais Cordeiro, Dharma Prakash Agrawal ,World Scientific Publishing Company, 2011
2. "Wireless Sensor Networks", Feng Zhao and Leonides Guibas,Elsevier Publication.
3. "Protocols and Architectures for Wireless Sensor Networks", Holger Karl and Andreas Willig,Wiley, 2005 (soft copy available)
4. "Wireless Sensor Networks Technology, Protocols, and Applications", Kazem Sohraby, Daniel Minoli, & TaiebZnati, John Wiley, 2007. (soft copy available)