MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act,1956

COURSE CONTENT

DEEP LEARNING LAB								
I Semester: CSE								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
2415833	**Professional Core courses**	**0**	**0**	**4**	**2**	**40**	**60**	**100**
Contact Classes: 0	**Tutorial Classes: 0**	**Practical Classes: 60**				**Total Classes: 60**		
Prerequisites: Strong foundation in deep learning								

Course Overview:

The Deep Learning Lab provides hands-on experience in building and training neural network models using Python and frameworks like TensorFlow, Keras, and PyTorch.

Course Objectives:

1. To build a strong foundation in deep learning concepts, architectures, and neural network models.
2. To understand and implement deep learning frameworks such as TensorFlow, Keras, and PyTorch.
3. To develop practical skills in designing and training convolutional and recurrent neural networks for real-world applications.
4. To develop practical skills in designing and training convolutional and recurrent neural networks for real-world applications.
5. To enable students to design, implement, and evaluate deep learning models for solving complex data-driven problems.

Course Outcomes: After Completion of the Course, Students should be able to

1. Implement gradient descent and backpropagation for training neural networks.
2. Evaluate the performance of autoencoders, GANs, and memory models for unsupervised learning tasks.
3. Implement deep learning architectures like CNNs and GANs for tasks like image generation and object detection
4. Analyze word similarity tasks and evaluate the quality of word representations in various NLP applications.
5. Implement LSTM and RNN models for various NLP tasks, including dialogue generation and sentiment analysis.

List Of Experiments

1. Setting up the Spyder IDE Environment and Executing a Python Program
2. Installing Keras, Tensorflow and Pytorch libraries and making use of them
3. Applying the Convolution Neural Network on computer vision problems
4. Image classification on MNIST dataset (CNN model with Fully connected layer
5. Applying the Deep Learning Models in the field of Natural Language Processing
6. Train a sentiment analysis model on IMDB dataset, use RNN layers with LSTM/GRU notes
7. Applying the Autoencoder algorithms for encoding the real-world data
8. Applying Generative Adversial Networks for image generation and unsupervised tasks.

TEXT BOOKS:

1. Deep Learning by Ian Goodfellow, Yoshua Bengio and Aaron Courville, MIT Press.
2. The Elements of Statistical Learning by T. Hastie, R. Tibshirani, and J. Friedman, Springer.
3. Probabilistic Graphical Models. Koller, and N. Friedman, MIT Press.

REFERENCE BOOKS:

1. Bishop, C, M., Pattern Recognition and Machine Learning, Springer, 2006.
2. Yegnanarayana, B., Artificial Neural Networks PHI Learning Pvt. Ltd, 2009.
3. Golub, G.,H., and Van Loan, C.,F., Matrix Computations, JHU Press,2013.
4. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw-Hill Education, 2004.

ELECTRONIC RESOURCES:

1. http://www.deeplearning.net
2. https://www.deeplearningbook.org/
3. https://developers.google.com/machine-learning/crash-course/ml-intro
4. www.cs.toronto.edu/~fritz/absps/imagenet.pdf
5. http://neuralnetworksanddeeplearning.com/

MATERIALS ONLINE:

1. Course template
2. Open-ended experiments
3. Definitions and terminology
4. Lab Manual