Subject Code	Subject Name	Credits
26CS612	DEEP LEARNING	4

Course Objectives

1. Understand complexity of Deep Learning algorithms and their limitations
2. Understand modern notions in data analysis oriented computing;
3. To be capable of confidently applying common Deep Learning algorithms in practice and implementing their own;
4. To be capable of performing distributed computations;
5. To be capable of performing experiments in Deep Learning using real-world data.

Learning Outcomes

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

1. To learn the various concepts related to Deep Learning

Unit 1 - Introduction to Deep Learning (12 Hrs.)

Introduction – Historical Trends in Deep Learning – Linear Algebra – Probability and Information Theory – Numerical Computation – Machine Learning Basics

Unit 2 - Deep Feedforward Networks (12 Hrs.)

Deep Feedforward Networks – Regularization for Deep Learning – Optimization for Training Deep Models – Convolutional Networks

Unit 3 - Sequence Modelling (12 Hrs.)

Recurring and Recursive Nets - Practical Methodology – Applications

Unit 4 - Deep Learning Research (12 Hrs.)

Deep Learning Research – Linear Factor Models – Autoencoders – Representation Learning – Structured Probabilistic Models for Deep Learning

Unit 5 - Monte Carlo Methods (12 Hrs.)

Monte Carlo Methods – Confronting the Partition Function – Confronting the Partition Function – Approximate Inference-Deep Generative Models.

References:

1. Goodfellow, Ian, Yoshua Bengio, and Aaron Courville. "Deep Learning (Adaptive Computation and Machine Learning series)." (2016): 800.
2. Weigel, Van B. Deep learning for a digital age: Technology's untapped potential to enrich higher education. Jossey-Bass, 989 Market Street, San Francisco, CA 94103-1741, 2002.