Course code	Course Title	L	T	P	C
BCSE332P	Deep Learning Lab	0	0	2	1
Pre-requisite	NIL	Syllabus version			
		1.0			

Course Objectives

1. Introduce major deep neural network frameworks and issues in basic neural networks
2. To solve real world applications using Deep learning.

Course Outcomes

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

1. Understand the methods and terminologies involved in deep neural network, differentiate the learning methods used in Deep-nets.
2. Identify and apply suitable deep learning approaches for given application.
3. Design and develop custom Deep-nets for human intuitive applications
4. Design of test procedures to assess the efficiency of the developed model.

To understand the need for Reinforcement learning in real – time problems.

Indicative Experiments

1.	Demonstration and implementation of Shallow architecture, using Python, Tensorflow and Keras • Google Colaboratory - Cloning GitHub repository, Upload Data, Importing Kaggle's dataset, Basic File operations • Implementing Perceptron, • Digit Classification : Neural network to classify MNIST dataset	10 hours
2.	Hyper parameter tuning and regularization practice - • Multilayer Perceptron (BPN) • Mini-batch gradient descent,	4 hours
3.	Convolution Neural Network application using Tensorflow and Keras, • Classification of MNIST Dataset using CNN • Face recognition using CNN	4 hours
4.	Object detection using Transfer Learning of CNN architectures	2 hours
5.	Image denoising (Fashion dataset) using Auto Encoders • Handling Color Image in Neural Network aka Stacked Auto Encoders (Denoising)	2 hours
6.	Text processing, Language Modeling using RNN	2 hours
7.	Transfer Learning models for classification problems	2 hours
8.	Sentiment Analysis using LSTM	2 hours
9.	Image generation using GAN	2 hours
	Total Laboratory Hours	**30 hours**

Text Book(s)

1.	Deep Learning, Ian Goodfellow Yoshua Bengio Aaron Courville, MIT Press, 2017
2	Neural Networks and Deep Learning, Michael Nielsen,, Determination Press

Reference Books

1.	Deep Learning Step by Step with Python, N D Lewis, 2016

2.	Deep Learning: A Practitioner's Approach, Josh Patterson, Adam Gibson, O'Reilly Media, 2017		
3	Applied Deep Learning. A Case-based Approach to Understanding Deep Neural Networks, Umberto Michelucci, Apress, 2018.		
4	Deep Learning with TensorFlow: Explore neural networks with Python, Giancarlo Zaccone, Md. RezaulKarim, Ahmed Menshawy, Packt Publisher, 2017.		
Mode of Evaluation: CAT / Mid-Term Lab/ FAT			
Recommended by Board of Studies	09-05-2022		
Approved by Academic Council	No. 66	Date	16-06-2022