

**SRINIVASA INSTITUTE OF ENGINEERING AND TECHNOLOGY****(UGC – Autonomous Institution)**

(Approved by AICTE, Permanently affiliated to JNTUK, Kakinada, ISO 9001: 2015 certified Institution)
(Accredited by NAAC with 'A' Grade; Recognised by UGC under sections 2(f) & 12(B))
NH-216, Amalapuram-Kakinada Highway, Cheyyeru (V), AMALAPURAM -533216.

**DEEP
LEARNING**A.Y:
2024-25

YEAR: III

SEMESTER:
II**COURSE SCHEDULE – AT A GLANCE**

Name of the Faculty : K VIJAY BABU

Name of the Course : DEEP LEARNING

Course Code : :21P61602

Branch : AIML

The Schedule for the whole Course is: 23/12/2024 To 26/04/2025

Unit	Description	Duration (Date)		Total No. of Periods
		From	To	
1	Fundamentals of Deep Learning: Artificial Intelligence, History of Machine learning: Probabilistic Modelling, Early Neural Networks, Kernel Methods, Decision Trees, Random forests and Gradient Boosting Machines, Fundamentals of Machine Learning: Four Branches of Machine Learning, Evaluating Machine learning Models, Overfitting and Underfitting	24/12/2024	21/01/2025	14
2	Introducing Deep Learning: Biological and Machine Vision, Human and Machine Language, Artificial Neural Networks, Training Deep Networks, Improving Deep Networks.	22/01/2025	12/02/2025	17
3	Neural Networks: Anatomy of Neural Network, Introduction to Keras: Keras, TensorFlow, Theano and CNTK, setting up Deep Learning Workstation, Classifying Movie Reviews: Binary Classification, Classifying newswires: Multiclass Classification.	13/02/2025	11/03/2025	14
4	Convolutional Neural Networks: Nerual Network and Representation Learning, Convolutional Layers, Multichannel Convolution Operation, Recurrent Neural Networks: Introduction to RNN, RNN Code, PyTorch Tensors: Deep Learning with PyTorch, CNN in PyTorch.	12/03/2025	03/04/2025	17
5	Interactive Applications of Deep Learning: Machine Vision, Natural Language processing, Generative Adversial Networks, Deep Reinforcement Learning. Deep Learning Research: Autoencoders, Deep Generative Models: Boltzmann Machines Restricted Boltzmann Machines, Deep Belief Networks.	04/04/2025	25/04/2025	16

Total No. of Instructional periods available for the course: 78

LESSON PLAN

COURSE: DEEP LEARNING

Unit No.	Topic	Plan		Actual		Teaching Methodology	Signature of the faculty
		No of hours	Date	No of hours	Date		
UNIT-1	Introduction to Deep Learning	1	24/12/24			Chalk &Talk /PPT	
	History of Machine Learning	1	26/12/24			Chalk &Talk /PPT	
	Probabilistic Modelling in Machine Learning	1	27/12/24			Chalk &Talk /PPT	
	Early Neural Networks	1	31/12/24			Chalk &Talk /PPT	
	Kernel Methods in Machine Learning	1	02/01/24			Chalk &Talk /PPT	
	Decision Trees	1	03/01/24			Chalk &Talk /PPT	
	Random Forests	1	07/01/25			Chalk &Talk /PPT	
	Gradient Boosting Machines (GBM) & Fundamentals of Machine Learning	2	08/01/25			Chalk &Talk /PPT	
	Supervised Learning	1	09/01/25			Chalk &Talk /PPT	
	Unsupervised Learning	1	10/01/25			Chalk &Talk /PPT	
	Evaluating Machine Learning Models	1	16/01/25			Chalk &Talk /PPT	
	Overfitting in Machine Learning	1	17/01/25			Chalk &Talk /PPT	
	Underfitting in Machine Learning	1	21/01/25			Chalk &Talk /PPT	
UNIT-2	Introduction to Deep Learning Biological Vision &Human Perception	2	22/01/25			Chalk &Talk /PPT	
	Machine Vision	1	23/01/25			Chalk &Talk /PPT	
	Linking Biological Vision to Machine Vision	1	24/01/25			Chalk &Talk /PPT	
	Introduction to Human Language Processing	1	28/01/25			Chalk &Talk /PPT	
	Human vs. Machine Language & Overview of Artificial Neural Networks (ANNs)	2	29/01/25			Chalk &Talk /PPT	
	Types of Neural Networks	1	30/01/25			Chalk &Talk /PPT	
	Training Neural Networks	1	31/01/25			Chalk &Talk /PPT	
	Activation Functions in Neural Networks	1	04/02/25			Chalk &Talk /PPT	
	Loss Functions in Deep Learning & Optimizing Deep Networks	2	05/02/25			Chalk &Talk /PPT	
	Overcoming Challenges in Training Deep Networks	1	06/02/25			Chalk &Talk /PPT	

	Improving Deep Networks: Regularization Techniques	1	07/02/25			Chalk &Talk /PPT	
	Improving Deep Networks: Batch Normalization	1	11/02/25			Chalk &Talk /PPT	
	Improving Deep Networks: Data Augmentation & Fine-Tuning Deep Networks	2	12/02/25			Chalk &Talk /PPT	
UNIT-3	Introduction to Neural Networks	1	13/02/25			Chalk &Talk /PPT	
	Anatomy of a Neural Network	1	14/02/25			Chalk &Talk /PPT	
	Types of Neural Networks	1	18/02/25			Chalk &Talk /PPT	
	Introduction to Keras & Introduction to TensorFlow	2	19/02/25			Chalk &Talk /PPT	
	Introduction to Theano	1	20/02/25			Chalk &Talk /PPT	
	Introduction to CNTK (Microsoft Cognitive Toolkit)	1	21/02/25			Chalk &Talk /PPT	
	Setting up a Deep Learning Workstation	1	25/02/25			Chalk &Talk /PPT	
	Introduction to Binary Classification	1	04/03/25			Chalk &Talk /PPT	
	Classifying Movie Reviews: Binary Classification Example & Introduction to Multiclass Classification	2	05/03/25			Chalk &Talk /PPT	
	Classifying Newswires: Multiclass Classification Example	1	06/03/25			Chalk &Talk /PPT	
	Evaluating Binary Classification Models	1	07/03/25			Chalk &Talk /PPT	
	Evaluating Multiclass Classification Models	1	11/03/25			Chalk &Talk /PPT	
UNIT-4	Introduction to Convolutional Neural Networks (CNNs) & Neural Networks and Representation Learning	2	12/03/25			Chalk &Talk /PPT	
	Convolutional Layers in CNNs	1	13/03/25			Chalk &Talk /PPT	
	Activation Functions in CNNs	1	18/03/25			Chalk &Talk /PPT	
	Pooling Layers in CNNs & Fully Connected Layers in CNNs	2	19/03/25			Chalk &Talk /PPT	
	Multichannel Convolution Operation	1	20/03/25			Chalk &Talk /PPT	
	Understanding Feature Maps in CNNs	1	21/03/25			Chalk &Talk /PPT	
	Introduction to Recurrent Neural Networks (RNNs)	1	25/03/25			Chalk &Talk /PPT	
	The Working Mechanism of RNNs Building an RNN Model: Code Example	2	26/03/25			Chalk &Talk /PPT	
	Introduction to PyTorch Tensors	1	27/03/25			Chalk &Talk /PPT	

	Deep Learning with PyTorch	1	28/03/25			Chalk &Talk /PPT	
	PyTorch Basics: Autograd and Optimization	1	01/04/25			Chalk &Talk /PPT	
	Building Neural Networks in PyTorch						
	Convolutional Neural Networks in PyTorch	2	02/04/25			Chalk &Talk /PPT	
	Training and Evaluating CNNs in PyTorch	1	03/04/25			Chalk &Talk /PPT	
UNIT-5	Introduction to Interactive Applications of Deep Learning	1	04/04/25			Chalk &Talk /PPT	
	Machine Vision in Deep Learning	1	08/04/25			Chalk &Talk /PPT	
	Object Detection and Classification with Deep Learning & Neural Networks (CNNs) for image processing	2	09/04/25			Chalk &Talk /PPT	
	Speech Recognition and Deep Learning	1	10/04/25			Chalk &Talk /PPT	
	Generative Adversarial Networks (GANs)	1	11/04/25			Chalk &Talk /PPT	
	Applications of GANs in Deep Learning	1	15/04/25			Chalk &Talk /PPT	
	Introduction to Deep Reinforcement Learning (DRL)	2	16/04/25			Chalk &Talk /PPT	
	Deep Q-Learning in DRL						
	Applications of Deep Reinforcement Learning	1	15/04/25			Chalk &Talk /PPT	
	Introduction to Deep Learning Research	1	18/04/25			Chalk &Talk /PPT	
	Autoencoders in Deep Learning	1	22/04/25			Chalk &Talk /PPT	
	Deep Generative Models Overview	2	23/04/25			Chalk &Talk /PPT	
	Boltzmann Machines						
	Restricted Boltzmann Machines (RBMs)	1	24/04/25			Chalk &Talk /PPT	
	Deep Belief Networks (DBNs)	1	25/04/25			Chalk &Talk /PPT	

Text Books:

1. Deep Learning- Ian Goodfellow, Yoshua Bengio and Aaron Courville, MIT Press, 2016
2. Deep Learning with Python - Francois Chollet, Released December 2017, Publisher(s): Manning Publications,ISBN: 9781617294433
3. Deep Learning Illustrated: A Visual, Interactive Guide to Artificial Intelligence - Jon Krohn, Grant Beyleveld, Aglaé Bassens, Released September 2019, Publisher(s): Addison-Wesley Professional, ISBN: 9780135116821

Reference Books:

1. Deep Learning from Scratch - Seth Weidman, Released September 2019, Publisher(s): O'Reilly Media, Inc.,ISBN: 9781492041412
2. Artificial Neural Networks, Yegnanarayana, B., PHI Learning Pvt. Ltd, 2009.