MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

COURSE PLAN

Department	:	Data Science and Computer Applications
Course Name & code	:	DSE-3159 & Deep Learning Laboratory
Semester & branch	:	V Sem & BTech Data Science & Engineering
Name of the faculty	:	Rohini R Rao , Abhilash Pai

No of contact hours/week:

L	T	P	C
0	0	3	1

Course Outcomes (COs)

	At the end of this course, the student should be able to:	No. of Contact Hours	Marks
CO1:	Build neural network models for the given dataset, experiment with parameters, and analyze its performance.	6	10
CO2:	Design, develop, fine-tune, and evaluate CNN-based models for Image classification	12	40
CO3:	Perform sequence modeling, develop, fine-tune, and evaluate models for tasks like Time series prediction and NLP	12	40
CO4:	Design, develop, fine-tune, and evaluate Autoencoders and Generative models for various tasks	6	10
CO5:	Click or tap here to enter text.	Hrs.	Marks
	Total	36	100

Assessment Plan

1. Continuous Evaluation	60%
2 evaluations of 20 marks each- 2 * 20 = 40 marks: Record (06), Program execution (07), Quiz (07) 1 mid-semester examination of 20 marks	
2. Lab Examination	40%
• Examination of 3 hours duration (Max. Marks: 40) Performance Analysis : 15 marks, Program execution : 25 marks.	

Lesson Plan

L. No.	Topics	Course Outcome Addressed
L1	Tutorial on Tensorflow, Keras, Tools, and framework for Deep Learning	CO1
L2	Given a structured data set: 1. Design and implement a deep neural network model for classification/prediction 2. Using various test strategies, and hyperparameter tuning, analyze and visualize its performance.	CO1
L3	Given datasets like MNIST: 1. Design and implement a Vanilla CNN to perform Image Classification 2. Compare the Vanilla CNN with Fully Connected Neural Network. 3. Using various test strategies, and hyperparameter tuning, analyze and visualize its performance.	CO2
L4	Given datasets like CIFAR, CatsandDogs: 1. Design and implement a conventional CNN for image classification. 2. Use Transfer Learning to perform Image Classification on a custom dataset. 3. Using various test strategies, and hyperparameter tuning, analyze and visualize its performance. 4. Evaluation 1-- Submission of record, Quiz	CO2
L5	Given a time-series dataset: 1. Design and implement an RNN to perform prediction. 2. Visualize the performance and comment on the performance of the model	CO2
L6	Mid Semester Examination	CO2
L7	Given a NLP dataset: 1. Perform necessary pre-processing 1. Design and implement LSTM/GRU model to perform sentiment analysis 2. Plot the performance curves, Confusion matrix and comment on the performance of model	CO3
L8	Given a Machine Translation dataset: 1. Design and implement an Encoder-decoder model (with Attention) to perform machine translation. 2. Plot the performance curves and comment on performance of model	CO3
L9	Given an NLP dataset: 1. Perform necessary preprocessing	CO3

	2. Use the pre-trained BERT model and generate text. 3. Record accuracy and performance.	
L10	Given the MNIST dataset: 1. Create a set of corrupted images 2. Train the autoencoder to denoise the corrupted images 3. Experiment with different hyperparameters and record the performance.	CO4
L11	Given the Fashion MNIST dataset: 1. Train the GAN to generate a new dataset. 3. Experiment with different hyperparameters and record the performance. Evaluation 2 – Submission of Record, Quiz	CO4
L12	Term End Lab examination	CO3
L13	Click or tap here to enter text.	CO
L14	Click or tap here to enter text.	CO

References:

1.	Aurelien Geron, "Hands-On Machine Learning with Scikit-Learn , Keras & Tensorflow, OReilly Publications
2.	Ahmed Menshawy, Md. Rezaul Karim, Giancarlo Zaccone, " Deep Learning with TensorFlow", Packt Publishing
3.	Introduction to Tensorflow, https://www.tensorflow.org/learn
4.	Keras Documentation, https://keras.io/
5.	Click or tap here to enter text.
6.	Click or tap here to enter text.
7.	Click or tap here to enter text.

Submitted by: Rohini R Rao, Abhilash Pai

(Signature of the faculty)

Date: 31-07-2023

Approved by: Dr. Radhika M Pai

(Signature of HOD)

Date: 31-07-2023

FACULTY MEMBERS TEACHING THE COURSE (IF MULTIPLE SECTIONS EXIST):

FACULTY	SECTION	FACULTY	SECTION
Rohini R Rao	A & B	Abhilash Pai	A & B

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