



**BITS Pilani**  
Pilani | Dubai | Goa | Hyderabad

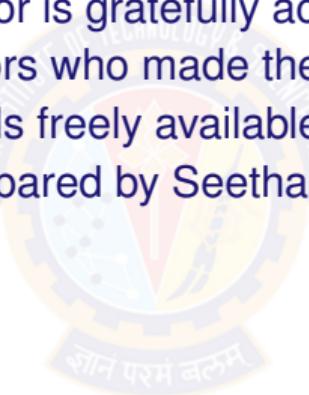
## DEEP NEURAL NETWORK COURSE INTRODUCTION

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BITS Pilani WILP

The instructor is gratefully acknowledging  
the authors who made their course  
materials freely available online.

This deck is prepared by Seetha Parameswaran.



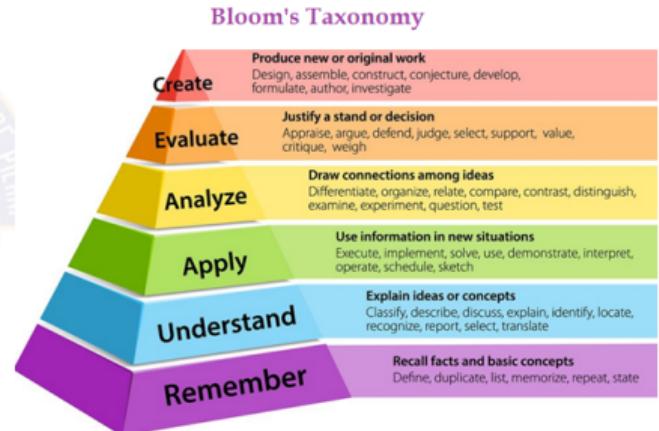
# TABLE OF CONTENTS

## 1 COURSE LOGISTICS



# COURSE OBJECTIVES

- CO1 Apply deep learning techniques, demonstrating proficiency in designing and implementing neural network architectures.
- CO2 Analyze the performance and behavior of deep learning models
- CO3 Evaluate the strengths and limitations of different deep learning architectures .
- CO4 Design and implement innovative deep learning solutions that integrate multiple techniques.



# COURSE HANDOUT = WHAT WE LEARN...

4 Credit Course

- 
- ① Deep Feedforward Neural Networks
  - ② Convolution Neural Networks
  - ③ Recurrent Neural Networks
  - ④ Attention Mechanism and Transformers
  - ⑤ Optimization and Regularization of Deep Models

# TEXT AND REFERENCE BOOKS

## TEXT Books

- T1 Zhang, A., Lipton, Z. C., Li, M., & Smola, A. J. (2023). Dive into deep learning. Cambridge University Press.

## REFERENCE Books

- R1 Goodfellow, I., Bengio, Y., Courville, A., & Bengio, Y. (2016). Deep learning (Vol. 1, No. 2). Cambridge: MIT press.
- R3 Chollet, F., & Chollet, F. (2021). Deep learning with Python. Simon and Schuster.

# LAB SESSIONS

- ① Use the Lab infrastructure provided by BITS Pilani WILP team.

L1 Perceptron implementation of Gates

L2 Auto MPG (UCI) prediction with a single neuron

L3 Breast Cancer Wisconsin (Diagnostic) (UCI) prediction with a single neuron

L4 Iris (UCI) prediction with a multiple neurons

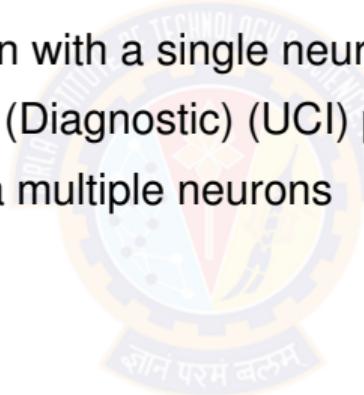
L5 CNN

L6 RNN, LSTM

L7 Transformers

L8 Optimisation

L9 Regularisation



# TAXILA LMS

Most relevant and up to date **info on LMS** regarding

- Handout
- Schedule for Quiz, and Assignments.
- Session Slide Decks
- Demo Lab Sheets
- Quizzes and Assignments



Only video recording will be available in Microsoft Teams.

# EVALUATION SCHEDULE

No	Name	Mode	Weight
EC1	Quiz I	Online	5 %
	Quiz II	Online	5 %
	Practice Lab Assignment I	Online	10 %
	Situated Learning Assignment II	Online	10 %
EC2	Mid-sem	Closed book	30%
EC3	Comprehensive	Open book	40%

# EVALUATION COMPUTATION

## EC1 COMPUTATION

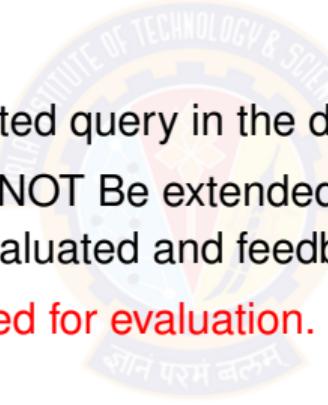
$EC1 = \text{Quiz I} + \text{Quiz II} + \text{Assignment I} + \text{Assignment II}$

**NO makeups for Quizzes and Assignments**

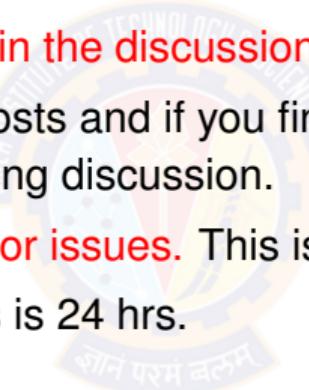
## TOTAL

$\text{Total} = EC1 + EC2 + EC3$

# ASSIGNMENT RELATED

- 
- ① Individual activity
  - ② Raise any assignment related query in the discussion forum.
  - ③ Assignment deadlines will NOT Be extended beyond Session 13, as the assignments have to be evaluated and feedback given.
  - ④ Last submission will be used for evaluation.

# DISCUSSION FORUM

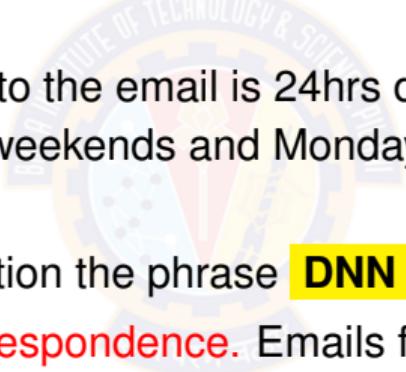
- 
- ① Post course related queries in the discussion forum.
  - ② Read through the existing posts and if you find any topic similar to your concern, add on to the existing discussion.
  - ③ Avoid duplication of queries or issues. This is highly appreciated.
  - ④ Turn around time for queries is 24 hrs.

# HONOR CODE

All submissions for graded components must be the result of your original effort. It is strictly prohibited to copy and paste verbatim from any sources, whether online or from your peers. The use of unauthorized sources or materials, as well as collusion or unauthorized collaboration to gain an unfair advantage, is also strictly prohibited. Please note that we will not distinguish between the person sharing their resources and the one receiving them for plagiarism, and the consequences will apply to both parties equally.

In cases where suspicious circumstances arise, such as identical verbatim answers or a significant overlap of unreasonable similarities in a set of submissions, will be investigated, and severe punishments will be imposed on all those found guilty of plagiarism.

# EMAIL ETIQUETTE

- 
- ① Email to **seetha.p@pilani.bits-pilani.ac.in** if the query or issue is not resolved within one weeks' time.
  - ② Turn around for response to the email is 24hrs during weekdays except Monday. Emails send on weekends and Mondays will be replied to by the following Tuesday.
  - ③ In the subject please mention the phrase **DNN** clearly.
  - ④ **Use BITS email id for correspondence.** Emails from personal emails will be ignored without any reply.

PATIENCE is highly APPRECIATED :)



Thank You!