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▾ **Welcome to Deep Learning Course**

About the course

   📄   **Brief History of Deep Learning**

Resources

   🔗   **ASU course link**

   📎   **INTRODUCTION TO COURSE**

▾ **Unit I: Introduction to ANN and Deep Learning**

CO1 : Define and Apply concepts of Artificial Neural Networks on real world data. Students will also be able to differentiate deep learning from shallow learning.

Week 1

   📎   **Lecture 2 Shallow Learning & NN(NCU)**

   📎   **Lecture 3 Single layer perceptron(NCU)**

   📎   **Practical 1 Tensor Flow.pdf(NCU)**

   📎   **Practical 1 COLAB_TensorFlow_2_0_Introduction.ipynb(NCU)**

Week2

🔗 **Lecture 4 multi layer perceptron and ANN (NCU)**

🔗 **Lecture 5 MLP Loss Functions.pptx(NCU)**

🔗 **Lecture 6 Gradient Descent (NCU)**

🔗 **Practical 2 Keras Slides.pdf(NCU)**

🔗 **Practical 2 Keras-Basics.ipynb(NCU)**

🔗 **Dataset_Celsius to Fahrenheit.csv(NCU)**

🔗 **Drill 01_COLAB_Perceptron_to_Convert_C_to_F.ipynb(NCU)**

Week 3

🔗 **Lecture 7A Backpropagation I (NCU)**

🔗 **Lecture 7B Backpropagation II (NCU)**

🔗 **Lecture 8 backpropagation_example**

🔗 **Lecture 9A Momentum (NCU)**

🔗 **Lecture 9B hyperparameter tuning in ANN**

🔗 **Practical 3A Keras_Syntax_Basics_Regression.ipynb(NCU)**

🔗 **Practical 3B Keras-Regression.ipynb(NCU)**

🔗 **Dataset kc_house_data.csv(NCU)**

Week4

 📎 **Lecture 10 Deep learning (ASU)**

 📎 **Practical 4_Keras-Classification-Early-Stopping.ipynb(NCU)**

 📎 **Dataset cancer_classification.csv(NCU)**

 📎 **Dataset fake_reg.csv(NCU)**

 📎 **What are Tensors.docx**

 🗩 **Deep Learning Vs Shallow Learning**

 📎 **DEEP_LEARNING.mp4 (external)**

▼ **Unit II : Deep Learning for Image Processing**

CO2 : Describe, Implement and Analyze Convolutional Neural Network for image datasets.Students will be able to describe the concepts of Convultional Neural Network and its architecture and implement the model for predictive analysis and analyze its performance on real world datasets.

Week 4

 📎 **L11 Introduction to Image Processing (NCU)**

 📎 **L12 Image Filtering (NCU)**

 📎 **Drill_01 (NCU)**

 📎 **Dataset Miles_Traveled.csv**

Week 5

📎 **Lecture 13 Image Segmentation (NCU).pdf**

📎 **Lecture 14 CNN (ASU).pdf**

📎 **Lecture15 Filters CNN (ASU).pdf**

📎 **Practical 5_Fashion MNIST Problem.ipynb(NCU)**

Week 6

📎 **Lecture 16 Stride and Padding.pdf**

📎 **Lecture 17 Pooling CNN (ASU).pdf**

📎 **Lecture18 Full Connection CNN (NCU).pdf**

📎 **Practical 6 Keras-CNN-MNIST.ipynb(NCU)**

Week 7

📎 **Lecture 19 Transfer Learning.pdf**

📎 **Lecture 20 Other Popular Architectures (NCU).pdf**

📎 **Practical 7 AlexNet on CIFAR10.ipynb(NCU)**

Extra Study Material

📎 **VGG16 ResNet50 InceptionV3.ipynb(NCU)**

📎 **LeNet on MNIST.ipynb(NCU)**

📎 **Stride and Padding.pptx(NCU)**

@ **Padding.docx (NCU)**

▾ **Unit III: Models for Sequential Analysis**

CO3: Explain ,Apply and Compare various sequential models for time series data.Students will be able to explain the requirement of sequential models for handling time series data ,apply the models for prediction and compare their performance on various applications.

Week 7

@ **Lecture 21 sequential model.pdf(NCU)**

Week 8

@ **Lecture 22 Recurrent Neural Network_NCU.pdf**

@ **Lecture 23 BiDirectional RNN.ipynb(NCU)**

@ **Lecture 24 RNN-Exercise.ipynb(NCU)**

@ **Practical 8 RNN_Alcohol_Sales (1).ipynb(NCU)**

@ **Dataset Alcohol_Sales.csv**

Week 9

@ **Lecture 25 vanishing_gradient.pdf(NCU)**

@ **Lecture 26 LSTM.pptx(NCU)**

@ **Lecture 27 LSTM Example.pdf(NCU)**

📎 **Practical 9 Understanding the LSTM cell.ipynb(NCU)**

Week 10

📎 **Lecture 28 Gated Recurrent Units(GRU).pdf (NCU)**

📎 **Lecture 29 LSTM Application.pdf (NCU)**

📎 **Lecture 30 SequenceLearningArchitectures.pdf(NCU)**

📎 **Practical 11 Predicting Bitcoins price using LSTM RNN.ipynb(NCU)**

📎 **btc.csv**

📎 **Practical 12 Generating Song Lyrics Using RNN.ipynb**

📎 **songdata.zip**

▾ **UNIT IV :Autoencoder**

Characterize, Use and Categorize various autoencoders for unsupervised deep learning.Students will be able to characterize different autoencoders, their usage and put them into various categories for unsupervised learning

Week 11

📎 **Lecture 31 Introduction to Autoencoders.pdf(NCU)**

📎 **Lecture 32 Variational encoders.pdf(NCU)**

📎 **Lecture 33 Building the Sparse Autoencoder.ipynb(NCU)**

📎 **Practical 11 Reconstructing MNIST images using Autoencoder.ipynb**

Week 12

📎 **Lecture 34 Image_Compression_Convulational Autoencoder.pdf(NCU)**

📎 **Lecture 35 Building Convolutional Autoencoder.ipynb(NCU)**

📎 **Lecture 36 Implementing Contractive Autoencoders.ipynb(NCU)**

Week 13

📎 **Lecture 37 Denoising autoencoders.pdf**

📎 **Practical 13 Denoising images using Denoising Autoencoder.ipynb**

▾ **UNIT 5 : Natural Language Processing**

CO5 : Identify the applications for natural language processing ,describe the various steps involved in natural language processing process and determine the best process for handling textual data for real world applications

Week 13

📎 **Lecture 38 Introduction to NLP .pdf(ASU)**

📎 **Lecture 39 Text Analytics I.pdf(ASU)**

📎 **Practical13 spacy.ipynb(ASU)**

Week 14

📎 **Lecture 40 Text Analytics II.pdf(ASU)**

📎 **Lecture 41Text Analytics III.pdf(ASU)**

📎 **Lecture 42 Text Analytics IV.pdf(ASU)**

📎 **Practical 14 Understanding Word2vec Model.ipynb(NCU)**

Week 15

📎 **Lecture 43 Text Analytics V.pdf(ASU)**

📎 **Lecture 44 Text_Mining.mp3(ASU)**

📎 **Lecture 45 Assignment.ipynb(ASU)**

📎 **Practical 15 Continuous Bag of words.ipynb**

📎 **Building word2vec model using Gensim.ipynb**

📎 **Visualizing Word Embeddings in TensorBoard.ipynb**

📎 **Finding similar documents using Doc2Vec.ipynb**

📎 **news_dataset.zip**

📎 **text.zip**