I.	**Basic Mathematics for DL (DL1)**			**Prof. Debdoot Sheet**
	• Solving systems of linear equations • Vector space, subspace, span, linear independence, basis, orthonormal basis • Linear transformation, affine transformation, Eigen value, Eigen vector, and Eigen decomposition • Singular value decomposition, principle component analysis • Basics of calculus	6 hours	Week 5	**19.09.2022 (10:00-12:00) (15:00-17:00)** **21.09.2022 (10:00-12:00)**
II.	**Introduction to Neural Networks (DL2)**			**Prof. Debasis Samanta**
	• Perception, concept of artificial neuron • Single layer perceptron • Multi-layer perceptron • ANN training algorithms	6 hours	Week 5 Week 6	**23.09.2022 (10:00-12:00) (15:00-17:00)** **26.09.2022 (10:00-12:00)**
III.	**Convolution Neural Networks (DL3)**			**Prof. Abir Das**
	• Basic concept of CNN: filtering, convolution, pooling • CNN architectures: AlexNet, ZFNet, VGG, C3D, GoogLeNet, ResNet, MobileNet-v1, EfficientNet • Regularization, dropout, batchnorm, etc.	8 hours	Week 6 Week 7	**26.09.2022 (15:00-17:00)** **28.09.2022 (10:00-12:00)** **30.09.2022 (10:00-12:00) (15:00-17:00)**
IV.	**Recurrent Architectures (DL4)**			**Prof. Pawan Goyal**
	• Sequential data, embeddings • Understanding RNN • LSTM architectures, BiLSTM • Attention models, transformer and its applications • Coverage mechanisms • NLP with RNNs	10 hours	Week 7 Week 8	**10.10.2022 (15:00-17:00)** **12.10.2022 (10:00-12:00)** **14.10.2022 (10:00-12:00) (15:00-17:00)** **17.10.2022 (10:00-12:00)**

V. Applications: Detection and Segmentation (DL5)			**Prof. Debdoot Sheet**
• Discussion on segmentation, problem definition, challenges • Evaluation, datasets and localization • Discussion on detection as classification • DNN for image processing	4 hours	Week 8	**17.10.2022 (15:00-17:00)** **19.10.2022 (10:00-12:00)** **21.10.2022 (15:00-17:00)**
VI. Autoencoder (DL6)			**Prof. Sudeshna Sarkar**
• Variational autoencoders • Stack autoencoders • Convolutional autoencoders • Denoising autoencoders	4 hours	Week 8	**20.10.2022 (10:00-12:00)** **21.10.2022 (10:00-12:00)**