

Following are Machine Learning NPTEL Courses available on NPTEL Repository

- <https://nptel.ac.in/courses/106/106/106106139/>
- <https://nptel.ac.in/courses/106/105/106105152/>
- <https://nptel.ac.in/courses/106/106/106106202/>
- <https://nptel.ac.in/courses/106/106/106106198/>
- <https://nptel.ac.in/courses/106/106/106106213/>
- <https://nptel.ac.in/courses/128/106/128106011/>

Following are Data Science NPTEL Courses available on NPTEL Repository

- <https://nptel.ac.in/courses/106/106/106106179/>
- <https://nptel.ac.in/courses/106/106/106106212/>
- <https://nptel.ac.in/courses/106/105/106105174/>
- <https://nptel.ac.in/courses/106/105/106105186/>
- <https://nptel.ac.in/courses/111/104/111104146/>

Online Book:

- <https://livebook.manning.com/book/introducing-data-science>
- <https://alex.smola.org/drafts/thebook.pdf>
- <https://www.greenteapress.com/thinkstats/thinkstats.pdf>
- <https://static1.squarespace.com/static/5ff2adbe3fe4fe33db902812/t/6009dd9fa7bc363aa822d2c7/1611259312432/SLR+Seventh+Printing.pdf>
- https://web.stanford.edu/~hastie/ISLR2/ISLRv2_website.pdf
- <https://www.cs.huji.ac.il/~shais/UnderstandingMachineLearning/understanding-machine-learning-theory-algorithms.pdf>
- <http://guidetodatamining.com/assets/guideChapters/Guide2DataMining.pdf>
- <http://infolab.stanford.edu/~ullman/mmds/book.pdf>
- <http://www.dkriesel.com/media/science/neuronalenetze-en-zeta2-2col-dkrieselcom.pdf>
- <https://www.deeplearningbook.org>
- <http://www.utstat.toronto.edu/~brunner/books/LinearModelsInStatistics.pdf>

<p>Unit I Regression Models Overview of statistical linear models, residuals, regression inference, Generalized linear models, logistic regression, Interpretation of odds and odds ratios, Maximum likelihood estimation in logistic regression, Poisson regression, Examples, Interpreting logistic regression, Visualizing fitting logistic regression curves. #Exemplar/Case Studies Remote sensing and GIS-based landslide hazard analysis and cross-validation using multivariate logistic regression model</p>	<ul style="list-style-type: none">● https://youtu.be/qNMEIN-3Wmg● https://youtu.be/_M7Km1XZERU● https://towardsdatascience.com/statistical-overview-of-linear-regression-examples-in-python-80a38680e053● https://youtu.be/_M7Km1XZERU● https://youtu.be/8PJ24SrQqy8● https://youtu.be/CbDMkitCjHg● https://youtu.be/z9XAXXGwUzM● https://www.statisticshowto.com/probability-and-statistics/probability-main-index/odds-ratio/● https://youtu.be/5h7emSudT1E● https://youtu.be/p7vBQqeV_Dc● https://youtu.be/ITi0SxmQTO8● https://youtu.be/8nm0G-1uJzA● https://youtu.be/TOPQnjSd23o● https://youtu.be/H-wMjPEyKZs IIScBangalore● https://youtu.be/8MpgZJHcB8w● https://youtu.be/83BXvIL3-el● https://youtu.be/kfFT4iTCDjg
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<p>Unit II Classification Methods</p> <p>Support Vector Machine classification algorithm, hyper plane, optimal separating hyperplanes , kernel functions, kernel selection, applications, Introduction to ensemble and its techniques, Bagging and Bootstrap ensemble methods, Introduction to random forest, growing of random forest, random feature selection</p> <p>#Exemplar/Case Studies Face recognition using SVM Or Product review case study in area of sentimental analysis using SVM and random forest classifiers</p>	<ul style="list-style-type: none"> ● https://youtu.be/jkFjfdQ1JDQ ● https://youtu.be/k15_5JM6ghU ● https://youtu.be/D0IfUDcEvs ● https://youtu.be/-QDguusDi2E ● https://youtu.be/ZndevdR4omw ● https://youtu.be/bEs4vK3GshI ● https://youtu.be/nelJ3svz0_o ● https://youtu.be/MRD67WgWonA ● https://youtu.be/waBlrjzs4Tc ● Case Study https://proceedings.neurips.cc/paper/1998/file/a2cc63e065705fe938a4dda49092966f-Paper.pdf ● https://towardsdatascience.com/building-a-facial-recognition-model-using-pca-svm-algorithms-c81d870add16 ● https://scholarworks.sjsu.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1322&context=etd_projects ● https://www.rcciit.org/students_projects/projects/cse/2018/GR20.pdf ● http://www.ijsred.com/volume4/issue1/IJSRED-V4I1P55.pdf ●
<p>Unit III Clustering Methods</p> <p>Overview of clustering and unsupervised learning, Introduction to clustering methods :Partitioning methods K-Means algorithm, assessing quality and choose number of clusters, KNN (1 NN, K NN) techniques, K-Medians, Density based method: Density-Based Spatial Clustering. Hierarchical clustering methods: Agglomerative Hierarchical clustering technique, Roles of dendrograms and Choosing number clusters in Hierarchical clustering, Divisive clustering techniques.</p> <p>#Exemplar/Case Studies Case study on DNA sequencing and hierarchical clustering to find the phylogenetic tree of animal evolution</p>	<ul style="list-style-type: none"> ● https://youtu.be/HTSCbxSxs-g ● https://youtu.be/zop2zuwF_bc ● https://youtu.be/qg_M37WGKG8 ● https://youtu.be/FeVrAK77mV8 ● https://youtu.be/NNuXuJFaJl4 ● https://youtu.be/NNuXuJFaJl4 ● https://youtu.be/AxARUMZh0sk ● https://youtu.be/afvYEVbo9qA ● https://youtu.be/C3r7tGR2eI ● https://youtu.be/pxkgGD5G4K8 ● https://youtu.be/NCsHRMkDRE4 ● https://youtu.be/ijUMKMC4f9I ● https://youtu.be/1jW9xlEtQao ● Case Study ● https://towardsdatascience.com/hierarchical-clustering-and-its-applications-41c1ad4441a6 ● https://www.khanacademy.org/science/ap-biology/natural-selection/phylogeny/a/phylogenetic-trees
Unit IV Artificial Neural Network	

<p>Biological neuron, models of a neuron, Introduction to Neural networks, network architectures (feed-forward, feedback etc.), Activation Functions Perceptron, Training a Perceptron, Multilayer Perceptrons, Back propagation Algorithm, Generalized Delta Learning Rule, Limitations of MLP #Exemplar/Case Studies Character reorganization using neural network</p>	<ul style="list-style-type: none"> ● https://youtu.be/olgnwStG9DE ● https://youtu.be/fUTwNOvoiyA ● https://youtu.be/93UyKhN2FRM ● https://youtu.be/wu-B_LHpBnU ● https://youtu.be/_eTMnZ1GIUM ● https://youtu.be/FG1NqbDekGo ● https://youtu.be/NSqcqyP97hg ● https://youtu.be/9H3gTYfaong ● https://youtu.be/3vSiMdG9mJY ●
<p>Unit V Convolutional Neural Network Convolutional Neural Network, Recursive Neural Network, Recurrent Neural Network, Long-short Term Memory, Gradient descent optimization #Exemplar/Case Studies Edge recognition using CNN</p>	<ul style="list-style-type: none"> ● https://youtu.be/cFgASecJGo8 ● https://youtu.be/gmr18xg4wTg ● https://youtu.be/2qak7ADfmpY ● https://youtu.be/1t3xixWyx2M ● https://youtu.be/sDv4f4s2SB8 ● https://youtu.be/SOxFd0VMFss ● https://youtu.be/rj8WOyw280k
<p>Unit VI Applications Perspective Text Preprocessing- tokenization, document representation, feature selection, feature extraction; Topic modeling algorithms- Latent Dirichlet Allocation; Text Similarity measure #Exemplar/Case Studies SMS classification</p>	<ul style="list-style-type: none"> ● https://youtu.be/fNxaJsNG3-s ● https://youtu.be/EMUYQqk69HA ● https://youtu.be/KTzXVnRlnw4 ● https://youtu.be/FwbXHY8KCUw ● https://youtu.be/cCIPO5KgU9o ● https://youtu.be/YYQmego-l1E ● https://youtu.be/mYh2MaOusCk ● Case Study https://youtu.be/U5xsX2ersHQ?list=PLbRMhDVUMngcx-ATexXZH_u1wslGliyS