



Module PMRF-ISSSO##

Principles of Machine Learning

Name of the PMRF student

Alokendu Mazumder

Required background of the students taught

BE/BTech/ME/MTech in any discipline
Pre-requisite: Basic Calculus and Probability

Online session coordinator

Will be chosen from the list of registrants



Details of the content of the module

Week 1: Essential Mathematics (L)

Basics of Topology, Convex Sets, Convex Functions, Probability Density Functions, PMFs, Conditional Distribution, Joint Distributions, Conditional Expectation

Week 2: Parametric Density Estimate (L)

Bayesian Classifier, Optimality Condition of Bayesian Classifier, Discriminant Functions, Maximum Likelihood Estimate, MAP Estimate

Week 3: Non-Parametric Density Estimate (L,D)

Parzen Window, KNN Estimate, Kernel Density Estimate

Week 4: Supervised Learning (L)

Linear Regression, Logistic Regression, Multiclass Classification

Week 5: Avoiding Overfitting

Bias-Variance Trade-off, Regularization, L1 and L2 Penalty

Week 6: Unsupervised Learning (L)

PCA, tSNE, Gaussian Mixture Models, K-Means Clustering

Week 7: Constrained Optimization and Applications (L)

Constrained Optimization & Lagrangian Duality, SVM & Kernel Machines

Week 8: Introduction to Deep Learning (L,D)

Deep Neural Networks, CNNs, RNNs & LSTMs

Schedule of the module

Saturday & Sunday – 1700 Hrs to 1830 Hrs

Duration: 22nd January 2023 – 11th March 2023

L – Lecture, D-Discussion

Meeting link : Will be shared later

[Link](#)

Contact email ID: issforum@gmail.com

Registration link:

<https://forms.gle/6g7NtYeGmBf8J3Uq5>