Data Science for Engineers(MCS-E7)

The contents of the syllabus available at

https://onlinecourses.nptel.ac.in/noc23_cs97/preview

Unit 1: Course philosophy and introduction to R
Unit 2: Linear algebra for data science, Algebraic view - vectors, matrices, product of matrix & vector, rank, null space, solution of over-determined set of equations and pseudo-inverse) Geometric view - vectors, distance, projections, eigenvalue decomposition
Unit 3: Statistics (descriptive statistics, notion of probability, distributions, mean, variance, covariance, covariance matrix, understanding univariate and multivariate normal distributions, introduction to hypothesis testing, confidence interval for estimates)
Unit 4: Optimization
Unit 5: Optimization, Typology of data science problems and a solution framework
Unit 6: Simple linear regression and verifying assumptions used in linear regression, Multivariate linear regression, model assessment, assessing importance of different variables, subset selection
Unit 7: Classification using logistic regression
Unit 8: Classification using kNN and k-means clustering

Books and references

1. INTRODUCTION TO LINEAR ALGEBRA - BY GILBERT STRANG
2. APPLIED STATISTICS AND PROBABILITY FOR ENGINEERS – BY DOUGLAS MONTGOMERY