

Course contents:

- Elementary Operations, Special Matrices & properties: Symmetric, Positive Definite, Orthogonal, Covariance Matrix. Norms, Trace, Determinant, Inverse, Echelon Form, Hands-on Exercises and Applications.
- Vector Spaces, System of Linear Equations, Rank and Nullity, Dimension reduction using rank, Hands-on Exercises and Applications.
- Eigenvalues, Eigenvectors, Cayley Hamilton Theorem, Numerical Computation of Eigenvalue, Hands-on Exercises and Applications.
- LU-Decomposition, QR-Decomposition, Principal Component Analysis (PCA), Singular Value Decomposition (SVD), Generalized Inverses, Dimension reduction. Least Square Method and Applications, Linear Regressions, Polynomial Regressions and Generalized Linear Models.

Credit system for the course:

- 20% weightage for homework assignments.
- 30% weightage for mid-sem exam. Mid-sem exam will be as per institute schedule.
- 50% weightage for end-Sem exam. End-sem exam will be as per institute schedule. End-sem exam will contain the whole syllabus, taught during the course.

References for the course:

1. H. Anton and C. Rorres; Elementary Linear Algebra, 11th Edition, Wiley, 2014.
2. E. Kreyszig; Advanced Engineering Mathematics, 10th edition, Wiley, 2019.