1.	Title of the course	Parallel Numerical Linear Algebra
2.	Course number	CS528L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To CS5231/15
6.	To be offered by	Department of Computer Science and Engineering
7.	To take effect from	January 2022
8.	Prerequisite	CoT
9.	**Course Objective(s):** To learn how to analyze, design and implement key linear algebra algorithms with a focus on performance and scalability.	
10.	**Course Content:** Introduction: parallel computing, algorithm design, programming; Approximations in scientific computing; Vector and matrix norms; Stability and conditioning; Matrix products; Gaussian elimination; Eigenvalues; QR factorization; Singular value decomposition; Least squares; Cholesky factorization; Sparse linear systems; Conjugate gradient; Preconditioning; Introduction to tensor algebra.	
11.	**Textbook(s):** 1. Jack J D, Iain S D, Danny C S and Henk A V D V, *Numerical Linear Algebra for High-Performance Computers*, 1st Edition, SIAM (1998). 2. James W D, *Applied Numerical Linear Algebra*, 1st Edition, SIAM (2018).	
12.	**Reference(s):** 1. Gene H G and Charles F V L, *Matrix Computations*, 4th Edition, Hindustan Book Agency (2015). 2. Holger W, *Numerical Linear Algebra An Introduction*, 1st Edition, Cambridge University Press (2018). 3. Michael H, *Scientific Computing*, 1st Edition, McGraw Hill Education (2011). 4. Volodymyr K, *Numerical Computations with GPUs*, 1st Edition, Springer Nature (2014).	