

COURSE NUMBER: Vv417	COURSE TITLE: Linear Algebra
CREDIT: 4	PREREQUISITES: Vv216/Vv256/Vv286
TEXTBOOKS/REQUIRED MATERIAL: Gilbert Strang, Introduction to Linear Algebra	PREPARED BY: Jing liu DATE OF PREPARATION: March 6, 2018 DATE OF UC APPROVAL:
INSTRUCTOR(S): Jing Liu	SCIENCE/DESIGN: N/A
CATALOG DESCRIPTION: Many problems in science, and engineering, and statistics are best formulated in terms of matrices. This course is a discussion of linear algebra, with emphasis on the properties of and operations on matrices. Diversity rather than depth of applications is stressed.	COURSE TOPICS: <ul style="list-style-type: none"> • Gaussian Elimination • Matrix Algebra • Inverse, Diagonal, Triangular, Symmetric, and Block Matrices • Determinant • Interpolation and Spline • Fundamental subspaces • Linear Independence, Basis, Rank, Nullity and Dimension • Classical Least Squares • Linear Transformation, Change of Basis • Metric, Normed and Inner Product Spaces • Orthogonality • Dual Bases • Second-order Tensor • Discrete Fourier Transform • Eigenvalues and Eigenvectors • Similarity • Page Ranking Algorithm • Hermitian, Unitary, and Normal Matrices • Single value Decomposition • Positive Definite Matrices • Nilpotent matrices and Jordan Structure
COURSE STRUCTURE/SCHEDULE: five 90-minute lectures every two weeks	
COURSE OBJECTIVES [Course Outcomes in brackets]	<ul style="list-style-type: none"> • To use mathematically correct language and notation for Linear Algebra. • To introduce the properties and operations on matrices with a wide variety of applications. • To become computationally proficiency involving procedures in Linear Algebra. • To provide the background for students to study the theorems in Linear Algebra. • To solve problems that apply Linear Algebra to Engineering.
COURSE OUTCOMES [Student Outcomes in brackets]	<p>After completing this course, students should:</p> <ul style="list-style-type: none"> • Develop a mathematical vocabulary by expressing mathematical ideas orally and in writing. • Be able to state mathematical definitions and apply theorems in Linear Algebra. • Be able to understand and construct simple proofs in Linear Algebra • Be able to interpret key concepts in Linear Algebra. • Be able to use computational techniques and algebraic skills essential for the study of systems of linear equations, matrix algebra, matrix decompositions, eigenvalue and eigenvectors. • Be familiar with the notion of a linear transformation and its matrix. • Be familiar with the notion of orthogonality. • Be familiar with the notion of similarity. • Be familiar with the notation of positive definiteness.
ASSESSMENT TOOLS [Course Outcomes in brackets]	<ul style="list-style-type: none"> • Assignment 25% • Midterm Exam 1 25% • Midterm Exam 2 25% • Final Exam 25%