SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
SYLLABUS *(Tentative)*
MATH 472/572 *Numerical Linear Algebra*

Objectives: To learn to manipulate and solve Linear Systems Numerically. Such systems arise in numerous areas of application including Economics, Engineering and Biology and are frequently much too large to handle "by hand". In this course we will learn to investigate them using Numerical Analysis.

Description: This is an ideal course for those who wish to solve real-world problems through mathematical techniques, and also learn about various errors which may contaminate numerical results.

Intended for: Majors in Mathematics or strong minors in mathematics majoring in science, engineering or economics.

Prerequisites: Programming experience (COSC 117, 118, or 120) and MATH 306.

Text: Numerical Methods and Analysis, 2nd edition by James F. Epperson; Wiley

Software: Mathematica and Matlab will be used extensively.

	Weeks
MatLab Preliminaries and Error Analysis Solutions of Tridiagonal Linear Systems	3
Computer arithmetic, errors in scientific computation, computer software. (sections 1.2-1.4; 1.6 and computer exercises)	
Numerical Methods for the Solution of Linear Systems	4
Linear Algebra review, Gaussian Elimination, Opperations counts, LU factorization, Perturbation, Conditioning and Stability.	
Approximate Solution of the Algebraic Eigenvalue Problem	4
Eigenvalue Review, Hassenburg Form, Power Methods, QR iteration, Application: Roots of Polynomials.	
Optional Topics	1
Tests and Review	2
	14.0

EVALUATION

Assignments and Projects	50%
Tests	25-38%
Final Examination	12-25%

Graduate students will be assigned special homework/test problems or projects.

NOTE: ONCE A STUDENT HAS RECEIVED CREDIT, INCLUDING TRANSFER CREDIT, FOR A COURSE, CREDIT MAY NOT BE RECEIVED FOR ANY COURSE WITH MATERIAL THAT IS EQUIVALENT TO IT OR IS A PREREQUISITE FOR IT.

KMS/ 1/2015