MAT 223 LINEAR ALGEBRA

Credits: 3+2

Catolog Description:

Eigenvalues and Eigenvactors, Diagonilization, Invariant subspaces and The Cayley-Hamilton Theorem, Inner Product Spaces, The Adjoint of a Linear Operator, Normal and Self-Adjoint Operators, Bilinear and Quadratic forms, Jordan Canonical forms, Minimal polynomial, Rational Forms.

Textbook:

Linear Algebra, L.E. Spence, A.J.Insel, S.H. Friedberg, 4th ed. 2003, Prentice Hall, Pearson Eductaion Inc. New Jersey. ISBN: 0-13-120266-9.

References:

1. Matrix Analysis and Applied Linear Algebra, Carl D. Meyer, SIAM Publication, 2000 / xii +718pages/Hardcover/ISBN0-89871-454-0, http://www.ecsecurehost.com/SIAM/ot71.html#OT71 **(Excellent text for matrices)**

2. *Linear Algebra with Applications*, Steven J. Leon, 6th ed. 2002, Prentice Hall, Pearson Eductaion Inc. New Jersey. ISBN: 0-13-035568-2

3. *Linear Algebra Done Right*, Sheldon Axler, Springer Verlag 2nd ed. 2002. ISBN 0-387-98258-2

4. *Elementary Linear Algebra*, L.E. Spence, A.J.Insel, S.H. Friedberg, 2000, Prentice Hall, Pearson Eductaion Inc. New Jersey. ISBN: 0-13-716722-9.

5. *Linear Algebra with Applications*, J. T. Scheick, McGraw-Hill 1997, ISBN: 0-07-115530-9.

Course Outline:

1. **Diagonalization** **(4 weeks)**

   Eigenvalues and Eigenvactors, Diagonilization, Invariant subspaces and The Cayley-Hamilton Thorem.

2. **Inner Product Spaces** **(6 weeks)**

   Inner Product and Norms, The Gram-Schimit Orthogonalization Process and Orthogonal Complements, The Adjoint of a Linear Operator, Normal and Self-Adjoint Operators, Unitary and Orthogonal Operators and Their Matrices, Orthogonal Projections and the Spectral Theorem, Bilinear and Quadratic forms.

3. **Canonical Forms** **(4 weeks)**

   The Jordan Canonical Forms, Minimal polynomial and The Canonical Rational Forms.

Grading: 25% is almost every week quizzes, no make up quiz but the minimum quiz will be excluded from the over all grading. 25% is one mid-term exam and 50% is the final exam.