

Engineering Analysis ENG 3420 Fall 2009

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Office: HEC 439 B

Office hours: Tu-Th 11:00-12:00

Lecture 15

- Last time:
 - Discussion of pivoting
 - Tri-diagonal system solver
 - Examples
- Today:
 - Symmetric matrices; Hermitian matrices.
 - Matrix multiplication
 - Non-commutative
 - Associative
 - The transpose of a product of two matrices
 - LU Factorization (Chapter 10)
 - Cholesky decomposition
- Next Time
 - Midterm

LU Factorization

- *LU* factorization involves two steps:
 - Decompose the $[A]$ matrix into a product of:
 - a lower triangular matrix $[L]$ with 1 for each entry on the diagonal.
 - and an upper triangular matrix $[U]$
 - Substitution to solve for $\{x\}$
- Gauss elimination can be implemented using *LU* factorization
- The forward-elimination step of Gauss elimination comprises the bulk of the computational effort.
- *LU* factorization methods separate the time-consuming elimination of the matrix $[A]$ from the manipulations of the right-hand-side $[b]$.