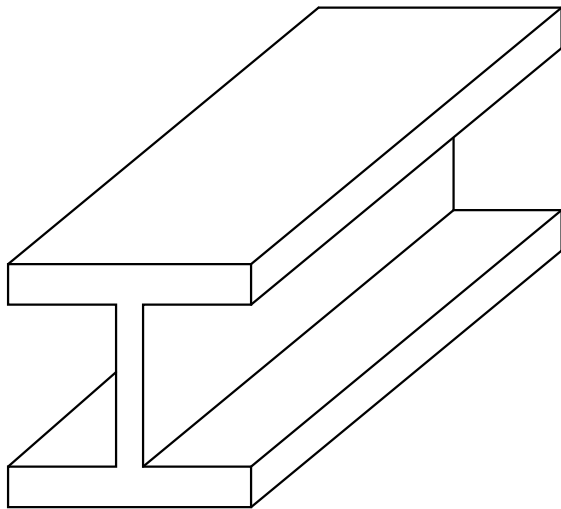


*CEE384—Numerical Methods*

# LU Decomposition

*Solving Linear Systems of Equations*



ARIZONA STATE UNIVERSITY

*Brian Chevalier*

Updated: November 25, 2019

## Contents

1 Overview	1
References	1

## 1 Overview

$$\mathbf{LU} = \mathbf{A}$$

$$\mathbf{Ax} = \mathbf{b}$$

$$\mathbf{PAx} = \mathbf{Pb} \equiv \mathbf{d}$$

$$\mathbf{Ly} = \mathbf{d}, \mathbf{y} \equiv \mathbf{Ux}$$

$$\mathbf{Ux} = \mathbf{y}$$

$$L_{i,j} = \frac{A_{i,j}}{A_{j,j}}$$

$$U_{i,:} - = L_{i,j} U_{j,:}$$

## References

- (1) [1] Chapra, Steven C. and Canale, Raymond P., *Numerical Methods for Engineers*, 7th ed. McGraw Hill Education, 2015.
- (2) [2] A. K. Kaw, E. E. Kalu, and D. Nguyen. Numerical methods with applications. [Online]. Available: [http://nm.mathforcollege.com/topics/textbook\\_index.html](http://nm.mathforcollege.com/topics/textbook_index.html)
- (3)
- (4)
- (5)
- (6)
- (7)