2.0 Module Overview: Inverse, Transpose, and Elimination Matrices

Module Overview

In this module we will talk about Gauss elimination in matrix form. You will learn how to compute elimination matrices and use them to transform a matrix into an upper triangular matrix.

A more thorough study of matrix operations will be conducted; most notably, we will concentrate on differences between matrix multiplication versus real number multiplication.

In addition, you will learn to identify invertible matrices and how to calculate the inverse of a square matrix using the Gauss-Jordan elimination.

The important notion of a matrix transpose will be introduced, and you will learn to calculate the transpose of a (rectangular) matrix and identify symmetric matrices.

Finally, combining the methods above you will learn to factor a matrix in LU and LDU forms, where L stands for lower triangular, U stands for upper triangular, and D stands for diagonal matrices.

Module Outcomes

As a result of this module, you will be able to do the following:

1. **Perform** Gauss elimination in matrix form.
2. **Calculate** the inverse of a matrix.
3. **Factor** a matrix in LU (lower triangular times upper triangular) and LDU forms.

Assigned Reading

- Chapter 2: Sections 2.3-2.7

Module Outline

In this module, we will cover the following:

+ A. Lecture Videos

+ B. Live Session

+ C. Assessments