CHEE 3602 – Topic 7: Ordinary differential equations

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Fall 2020

Introduction

Goals

To develop a comprehensive understanding of ordinary differential equations and consider multiple solution approaches including adaptive and multi-step methods.

Outline

1. Theoretical principles
2. Euler methods
3. Adams-Bashforth methods
4. Runge-Kutta methods

Learning outcomes

By the end of this topic, you should be able to perform each of the following:

1. Classify differential equations as ordinary or partial as well as determine differential order
2. Understand how to derive multi-step Adams-Bashforth methods
3. Apply Euler (both explicit and implicit), Adams-Bashforth, and Runge-Kutta methods to solve 1-dimensional ordinary differential equation problems