

Instructions

After reading the in-class code for solving the second-order linear differential equation with distinct real roots using MATLAB functions, complete the following problems. The purpose of this assignment is to define functions in Matlab to solve multiple ODEs or multiple initial conditions. To complete this Lab, you will need your codes from the previous assignment 2. For each problem,

- (1) copy and paste your entire Matlab codes into a .txt file; add comments to your codes to describe the code as needed;
- (2) import the Matlab figure to your report (i.e., text file).
- (3) All figures must have a title, label, and legend as needed.
- (4) If an output appears in the command line that answers the question, then you will copy and paste this into a .txt file along with a brief description.
- (5) Upload your final solutions (codes, description, inputs, outputs, figures, etc) as a single file (preferably PDF format) on Canvas by Sunday, April 10, 2022, at 11:59 pm.

PROBLEMS

Problem 1.

Define **MATLAB function** to solve a second-order linear differential equation with constant coefficients for the case with complex roots of the characteristic equation. Outputs must include solutions, and plots of examples 1, 2, and 3 of Section 3.3 in the textbook pages 121-123. Please make sure to use the given initial conditions and axes limits to render the same plot as presented in the textbook.

Problem 2.

Define **MATLAB function** to solve a second-order linear differential equation with constant coefficients for the case with real repeated roots of the characteristic equation. Outputs must include solutions and plots of examples 1 and 2 of Section 3.4 in the textbook pages 127-129. Please make sure to use the given initial conditions and axes limits to render the same plot as presented in the textbook.