Make sure to read all the instructions listed on this document!

Learning objectives

Please study your class notes and the corresponding sections of the textbook before completing the assignment. After completing this assignment, you should be able to:

- Derive the equation of motion for a N DOF systems using Lagrange's equation
- Find the natural frequencies and mode shapes of N DOF systems
- Find the free vibration response of an undamped N DOF system using modal analysis

Solve the following problems of the textbook:

- 6.42
- 6.58
- 6.78. Plot the angles θ_1(t), θ_2 (t) and θ_3 (t) as a function of time.

For each problem, you need to show your work and circle your final answer. Please staple your homework.