

MAE 292 Final exam details

Assigned: Monday 6/8/2020

Due: Wednesday midnight 6/10/2020

The final exam is a take home open note, open book exam. It will be cumulative over the quarter's topics (see below). The final will be constructed such that you can complete it in the allotted time, with recognition that most people will have other finals at the same time. The final questions will closely match the HW questions or problems worked in lecture.

Topics

1. Representations of points (homogeneous coordinates)
2. Transformations of points (rotation, scaling, translation)
3. Representations of curves:
 - a. Parametric curves
 - b. Functional curves
4. Curves generated from data
5. Motion kinematics in cams
6. Linkage kinematics
 - a. How to set up constraint equations and solve
 - b. How to identify mobility of the system
 - c. How to model
7. Optimization
 - a. Unconstrained
 - b. Constrained
8. Finite element method
 - a. Underlying energy principles
 - b. The global stiffness equation and constraints
 - c. 1D elements
 - i. Spring
 - ii. Bar
 - d. 2D elements
 - i. Beams
9. Fusion 360 design and simulation
10. Matlab