CEE526/MAE527 Finite Elements for Engineers
Modeling Project 1-2
Due date: See class website

Write a report (use the style *from FE Modeling Case Studies* document). A sample MS Word document is available on the class web site and can be used as a style guide.

The report should have a cover page, table of contents, list of figures and tables, page numbers, and several sections. As a minimum the following sections are recommended - (a) *Problem Statement* including statements on the response parameters that you are monitoring, (b) *FE Model* where you show via tables and text the material properties, element types used, boundary conditions and loads, (c) *Analysis Results* including details of the FE models used and the response quantities obtained, (d) *Convergence Analysis*, (e) *Concluding Remarks* and (f) *References*. The figures and tables should be labeled and called out in the text. Equations should be properly typed and should have equation numbers. Check your document carefully for spelling and grammatical errors. Write in third person using passive voice.

The report (as a Microsoft Word file) should be turned in electronically (e-mail to s.rajan@asu.edu) by the due date.

Problem 1: For the torque arm shown in Figure 1, determine the following:
(a) the maximum displacement, and
(b) maximum von Mises stress.

5000 N

42.0

5.4

2.0

4.0 3.0

2.5 4.3 → 2800 N

4.0

$t = 1.0$ cm

(All dimensions in cm)
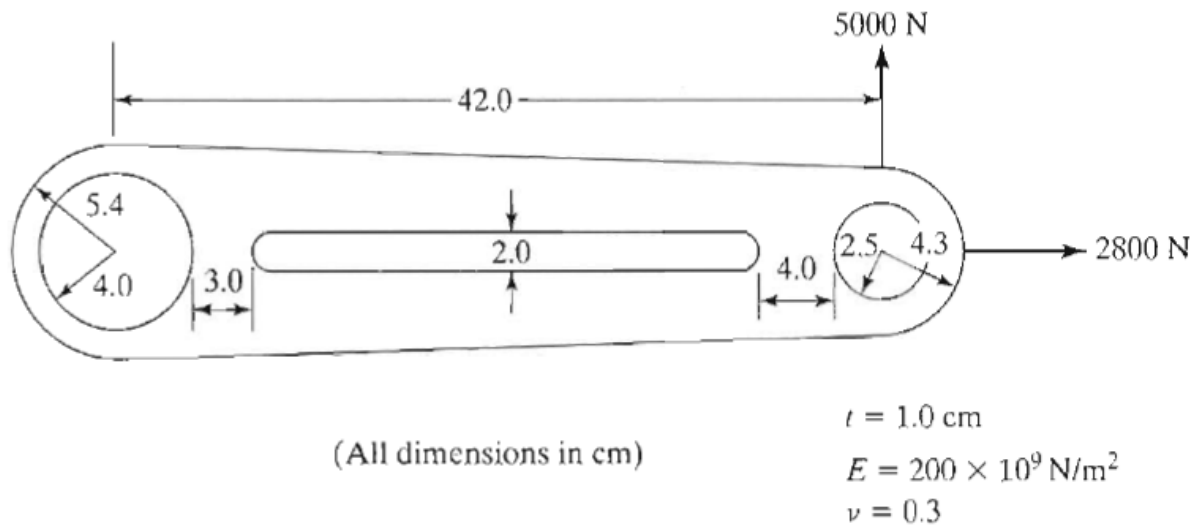
$E = 200 \times 10^9$ N/m^2

$\nu = 0.3$

Figure 1

Problem 2: A large, flat surface of a steel body is subjected to a line load of 100 lb/in. Consider an enclosure as shown in Fig. 2 and determine the largest deformation of the surface and the maximum von Mises stress.
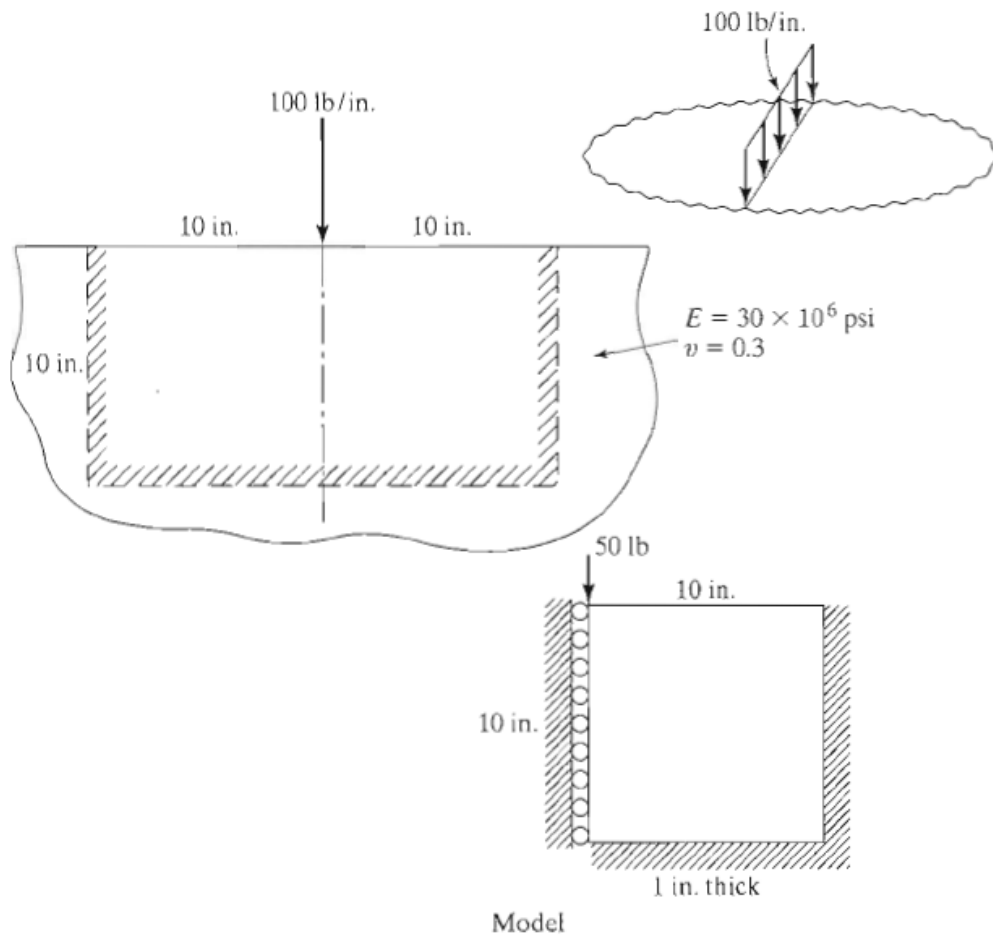

Figure 2