HW#9 **ME 4210** **Due Date: Friday, November 20, 2015**

1. Write a MATLAB function that takes three sets of inputs (1) Engineering constants (2) Stacking sequence and ply thickness and returns laminate stiffness matrices (A, B & D)

2. Using your code, show the stiffness matrices for the laminates with the following properties and stacking sequences.

   $E_1 = 163$ GPa GPa $E_2 = 11.31$ GPa $G_{12} = 5.50$ GPa $v_{12} = 3.13$ $t = 1$ mm

   a. Symmetric $[\pm 30/\mp 45]_S$
   b. Cross ply $[(0/90)_2]$
   c. Balanced $[30/0/60/-30/-60]$
   d. Symmetric Cross ply $[(0/90)_2]_S$

3. For each of the above laminates, indicate which types of couplings are present.