ME500/AA535 Homework Set #6
Due Wednesday 27 May

Problem 1: A $[(90_2/0)_2]_s$ graphite-epoxy laminate is cured at $175°C$ and then cooled to room temperature ($20°C$). After cooling the flat laminate is trimmed to in-plane dimensions of 450 x 150 *mm* and mounted in an assembly that provides type S4 simple supports along all four edges. The *x*-axis is defined parallel to the 450 *mm* edge (i.e., *a* = 0.45 *m*, *b* = 0.15*m*).

(a) Prepare a plot similar to Figure 11.9a, showing the critical buckling load N_{xx}^c if $0 \leq N_{yy} \leq 500 \, kN/m$.

(b) Prepare a plot similar to Figure 11.10a, showing the critical buckling load N_{yy}^c if $0 \leq N_{xx} \leq 500 \, kN/m$.

Use the properties listed for graphite-epoxy in Table 3.1.

Problem 2: A structure is being designed that will involve a $[(90_2/0)_2]_s$ graphite-epoxy laminate with a width (in the *y*-direction) of 150 *mm*. The length of the panel (in the *x*-direction) has not yet been established, and could be anywhere from 150 *mm* to 750 *mm*. During service the panel will be subjected to a compressive load N_{xx} (only), and simple supports of type S4 along all four edges. Buckling is therefore of concern. Plot the buckling load and mode for the panel, for any panel length ranging from 150 *mm* to 750 *mm*. Use a plotting format similar to Figure 11.11, and use properties listed for graphite-epoxy in Table 3.1.