ENGINEERING PHYSICS 4D3 Assignment #9 Set:
Due:

1. [Duderstadt & Hamilton 12-3]

   Determine the temperature profile in plate-type fuel elements composed of fuel of thickness 2 r_F sandwiched between a clad of thickness t_C. Assume a gap thickness t_G.

2. [Duderstadt & Hamilton 12-8]

   Consider two cylindrical fuel rods of radii a and 2a respectively which are to operate under the limitation that the maximum center-to-outer surface temperature difference is ΔT. Assuming uniform heat generation in the rods, which rod would be able to supply more heat.

3. [Duderstadt & Hamilton 12-9]

   It is frequently of interest to determine the temperature distribution in shielding material being heated by incident radiation (e.g., photons or neutrons). Such a calculation can easily be performed in analogy to our study of thermal conductance on fuel elements, provided one uses a distributed heat source. Consider a slab shield of thickness L with a radiation flux φ_0 incident upon one face. If the radiation intensity is assumed to be attenuated as $\varphi_0 \exp(-G_a x)$, determine the temperature distribution across the shield. Assume we maintain the surfaces at x=0 and x=L at specified temperatures T_0 and T_L.