ENGINEERING PHYSICS 3D3 Assignment on Point Kinetics due March 27, 2000

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1. A flux of $1x10^{13}$ n/cm^2-s impinges on an absorbing slab ($\Sigma_a = 1$ cm^{-1}). Assume the neutrons are thermal. Calculate the energy absorption rate due to neutrons at a point 10 cm inside the shield.
   [**Hint:** What is the energy of a thermal neutron?]

2. A U^{235}-fuelled reactor is operating at a flux of $1x10^{12}$. It is scrammed by the sudden insertion of the safety rods which have a total worth of -85 mk.
   (a) Calculate the immediate change in neutron flux.
   (b) Calculate the neutron flux, 10 minutes after shutdown. Assume one delayed group with a half-life of 55 seconds. [**Hint:** The neutron density, n(t), has a much faster dynamic than the delayed precursors. Where do the neutrons come from after shutdown?]