**Primer on Semiconductors: Lecture 5.1 Short Problem**

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Provide a numerical answer to the question below. Assume silicon for which .

1a) The Poisson equation is



Assume that we have doped the semiconductor to  cm-3. Also assume that the semiconductor is “depleted” of free carriers, so that . What is the space charge density, , in C/cm3?

1b) Considering problem 1a), how much does the magnitude of the electric field change in a distance of 1 nm?