PHYSICS 2401

Lab Homework – Charged Particle in an Electric Field

This homework will be due when you come to lab the week of February 10.

1. A small charged sphere is attached to a thread and placed in an electric field. The other end of the thread is anchored so that when placed in the field the sphere is in a static situation (all the forces on the sphere cancel). The sphere has a mass of 0.012 kg and contains a charge of $+ 59.30 \times 10^{3}$ C. The tension in the thread is 6.57×10^{-2} N. Show your work and/or explain your reasoning. If the thread is horizontal, find the magnitude and direction of the electric field. (20 pts)

2. Now the same particle is removed from the thread and placed above the center of a charged plate and released. Are there any conditions under which it is possible for the particle to be suspended in the air above the plate? Show any relevant calculations and explain your reasoning. (10 pts)