$$\vec{F} = m\vec{a}$$

$$\frac{-e^2}{r^2}\hat{r} = -mr\omega_0^2\hat{r}$$

$$\Rightarrow \qquad \omega_0 = \left(\frac{e^2}{mr^3}\right)^{1/3}$$

Now assume there is a magnetic field

$$\vec{B} = B_z\hat{k}$$