**Units: Formulae**

**point charges only**

Electrostatic Force: $\rightharpoonaccent{F\_{e}}$ Newtons: N = $\frac{kg m}{s^{2}}$ $F\_{e}= K\frac{\left|q\_{1}q\_{2}\right|}{r^{2}}$

$$\rightharpoonaccent{F}=q\rightharpoonaccent{E}$$

Vectors

Electric Field: $\rightharpoonaccent{E}$ $\frac{Newtons}{Coulomb}= \frac{N}{C}= \frac{V}{m}$ $E = K\_{ }\frac{\left|q\right|}{r^{2}}$

Electric Potential Energy: $U\_{elec}$ Joules: J = N m = V C $U\_{elec}= $ $K\frac{q\_{1}q\_{2}}{r}$ $U\_{elec}$ *= qV = -qEx*

Scalars

Electrostatic potential: *V* Volts: V = $\frac{N m}{C}$ $V= K\_{ }\frac{q}{r}$ *V = -Ex*

Scalars

Change in Potential Energy $U\_{elec}$

Potential Difference *V* Volts: V

**Capacitors:**

Charge: *Q* Coulomb: C *Q = C* *VC*

Capacitance: *C* Farad: F *C = QVC C = o**A / d*

Potential energy $U\_{c}$ Joules: J $U\_{c}$ *= ½ QVC = ½ C(VC)2 = ½ Q2/C*

stored in a capacitor

Other useful relationships for capacitors:$\rightharpoonaccent{F}=q\rightharpoonaccent{E}$* V = -Ex*

*K* = 8.99 x 109 Nm2/C2 *o*= $\frac{1}{4πK} $= 8.85 x 10-12 C2/Nm2 Electron charge:*e*= – 1.6 x 10-19 C

= micro = 10-6  n = nano = 10-9 p = pico = 10-12