Electric flux through a surface

$$\Phi_E = \int E \cos \phi \, dA = \int E_\perp \, dA = \int \vec{E} \cdot d\vec{A}$$

Magnitude of electric field $\vec{E}$

Component of $\vec{E}$ perpendicular to surface

Angle between $\vec{E}$ and normal to surface

Element of surface area

Vector element of surface area

The SI unit for electric flux is $1 \, \text{N} \cdot \dfrac{\text{m}^2}{\text{C}}$.