# SCCC 312A

## Some Formulas That You May Use
## Together with the formulas for CIs and Hypothesis Testing

$$\overline{X} = \frac{1}{n}\sum X_i$$

$$S^2 = \frac{1}{n-1}\sum \left(X_i - \overline{X}\right)^2$$

$$P(B) = P(A)P(B|A) + P(A^c)P(B|A^c)$$

$$P(A|B) = P(AB)/P(B)$$

$$\mu = \sum xp(x)$$

$$\sigma^2 = \sum (x-\mu)^2 p(x) = [\sum x^2 p(x)] - \mu^2$$

$$\mu = np$$
$$\sigma^2 = np(1-p)$$

$$p(x) = \binom{n}{x} p^x (1-p)^{n-x}$$

$$P(a < X < b) = P\left(\frac{a-\mu}{\sigma} < Z < \frac{b-\mu}{\sigma}\right)$$

$$\overline{X} \text{ approx. } N\left(\mu_{\overline{X}} = \mu, \sigma^2_{\overline{X}} = \frac{\sigma^2}{n}\right)$$

$$\hat{p} \text{ approx. } N\left(\mu_{\hat{p}} = p, \sigma^2_{\hat{p}} = \frac{p(1-p)}{n}\right)$$

$$ME = (z_{\alpha/2})\sigma_{\overline{X}} = (z_{\alpha/2})\frac{\sigma}{\sqrt{n}}$$

$$n = \frac{(z_{a/2})^2 \sigma^2}{E^2}$$

E = maximum distance from $\mu$; $z_\alpha$ is such that $P(Z > z_\alpha) = \alpha$.