Biostatistics 140.623
Final Exam Formula Sheet

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ...\varepsilon$$

$$F_{s,\, n-p-s-1} = \frac{(RSS_{Null} - RSS_{Extended})/s}{RSS_{Extended}/(n-p-s-1)}$$

$$\ln = \log_e$$

$$\ln\left(\frac{a}{b}\right) = \ln(a) - \ln(b)$$

$$\frac{e^{a+b}}{e^{a}} = e^{b}$$

$$\log odds = \text{logit}[\Pr(Y=1)] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ...\beta_s X_s$$

$$\Pr(Y=1) = \frac{e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + ...\beta_s X_s}}{1 + e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + ...\beta_s X_s}} = \frac{odds}{1+odds}$$

LRT (Likelihood Ratio Test) $= -2\,(LL_{Null} - LL_{Extended})$

where LL = log likelihood

Proportional Hazards Model :

$$\log \lambda(t;X) = \log \lambda_0(t:X) + \beta_1 X_1 + ... + \beta_p Xp$$

$$\lambda(t;X) = \lambda_0(t;X) e^{\beta_1 X_1 + ... + \beta_p Xp}$$

$$S(t;X) = [S_0(t)]^{e^{X\beta}}$$