MTH 3240 EXAM II TOPICS

(Exam problems will be similar to homework problems and examples done in class.)

Two-sample *t* test:

Know when the test is appropriate (i.e. to test for the difference $\mu_x - \mu_y$ between two population means μ_x and μ_y when the samples are from normal distributions or n_x and n_y are large).
Know how to carry out this test (using the p-value approach).

Two-sample *t* confidence interval for $\mu_x - \mu_y$ (effect size): Know how to compute and interpret this.

Rank sum test:

Know when the test is appropriate (ie. to test for two population means μ_x and μ_y when the samples are from non-normal distributions and n_x and n_y aren't large).
Know how to carry out this test (using the p-value approach).

Paired study designs: Know the difference between this study design and independent samples study designs and know what the advantage of a paired design is.

Paired *t* test:

Know when the test is appropriate (ie. to test for the difference $\mu_x - \mu_y$ between two population means μ_x and μ_y (or equivalently for μ_d) when the sample of *differences* can be treated as a sample from a normal distribution or n is large).
Know how to carry out this test (using the p-value approach).

Paired *t* confidence interval: Know how to compute and interpret this.

Sign test for paired samples:

Know when the test is appropriate (ie. to test for the difference $\mu_x - \mu_y$ between two population means μ_x and μ_y (or equivalently for μ_d) when the sample of *differences* is from any non-normal distribution and n isn't large).
Know how to carry out this test (using the p-value approach).

Signed ranks test for paired samples:

Know when the test is appropriate (ie. to test for the difference $\mu_x - \mu_y$ between two population means μ_x and μ_y (or equivalently for μ_d) when the sample of *differences* is from a non-normal but symmetric distribution and n isn't large).
Know how to carry out this test (using the rejection region approach).

One-factor ANOVA:

Know when the test is appropriate (ie. to test for differences among k population means $\mu_1, \mu_2, \ldots \mu_k$ when the k samples are from normal distributions whose standard deviations are equal or the sample sizes are all large).
Know what the following are:

- Group means version of the one-factor ANOVA model
- Sums of squares (know what they measure)
- Degrees of freedom
- Mean squares
- F test statistic, null and alternative hypotheses, p-values
- ANOVA table
- Fitted values and residuals

Kruskal-Wallis test:

Know when the test is appropriate (ie. to test for differences among k population means $\mu_1, \mu_2, \ldots \mu_k$ when the k samples are from non-normal distributions and the sample sizes aren't all large).
Know how to carry out this test (using the p-value approach).

Two-factor ANOVA:

Know when the test is appropriate (ie. to test for the effects of two factors when the ab samples are from normal distributions whose standard deviations are equal or the sample sizes are all large).
Know what the following are:

- Additive two-factor ANOVA model
- Two-factor ANOVA model with interaction effect
- Interaction effect, main effects, interaction plots
- Sums of squares (know what they measure)
- Degrees of freedom
- Mean squares
- F test statistic, null and alternative hypotheses, p-values
- ANOVA table
- Fitted values and residuals