SYLLABUS: PSYCHOLOGY 209 Quantitative Methods

Instructor: Jeff Franks
Office: 533 Psychology Bldg.
Office Hrs.: M 12-2 or by appt.

TAs:

Jonathan Stadler
Office: WH 011
Office hours: Tues, Wed 8:00 -10:00 pm @The Overcup Oak in Sarratt

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Texts: Fundamental Statistics for Behavioral Sciences Robert B. McCall
"Study Guide for Psychology 209" (available from Campus Copy)

Supplies:
i) calculator (with square root),
ii) class disk available from the desk in the computer lab (120 Garland Hall)

How to use the text: The assigned chapters and pages as listed are intended to
supplement the lectures. The lectures don't follow the order of chapters in the text and the text
covers some material that won't be covered in the lectures, i.e., not all the information in each
assigned chapter is perfectly pertinent to the course requirements. The way to organize your study
is to use the list of possible test questions in your class pack. Those questions will tell you what is
pertinent to this course and you can selectively read the text from that perspective

Laboratory Classes:
There will be three sets of laboratory orientation classes that will
meet in the Garland Hall computer lab. The classes will overview the
use of computers for calculation of statistics for the course which will
provide the basis for the take home laboratory quizzes that are required
in the course. Separate lab classes will be offered on the dates and
times below. Please try to arrange your schedules so that you can
attend the laboratory at one of these times for all three labs. There
will not be a regular lecture class on Friday in which there are lab
classes.

First Lab Classes: Wed. Sept. 26 3-4:30 or Thurs. Sept. 27 3-4:30 or
Thurs. Sept 27 4:30-6
Topic: descriptive statistics and difference t-test
First take home lab quiz due: Fri. Oct. 5 at classtime
Topic: independent group t-test and one way anova
Second take home lab quiz due: Fri. Nov. 2 at classtime

Third Lab Classes Wed. Nov. 28 3-4:30 or Thurs. Nov. 29 3-4:30
Topic: two way anova [the lab work for correlation/regression and Chi-square will be covered in regular class lecture but will appear on quiz]
Third take home lab quiz due: Fri. Nov. 30 at classtime

Lecture and Exam schedule:

Lecture 1 introduction chap. 1 4-9, 12-16; chap. 3 69-71

Lectures 2-4 chap. 2 28-43, 46-49; chap. 3 59-69
demonstrations: descriptive statistics
demonstration: frequency and probability distributions
demonstration: mean
demonstration: means, variances, and standard deviations
demonstrations: relations between scores, means, and variances
demonstration: mean as central tendency
demonstration: variances and standard deviations

Lectures 5-6 chap. 8 192-207
demonstrations: sampling distribution of mean, M
demonstration: sampling distribution of means
demonstration: the effects of sample size

Lectures 7-9 chap. 5 113-124; chap. 9
demonstrations: z, t, and inferences for a single mean
demonstration: z distribution and z scores
demonstration: z distribution, t distribution, and t-scores
demonstration: t test and inference for single mean

Lectures 10-12 chap 9; chap. 10 247-251
demonstrations: z, t, and inferences for a single mean
demonstrations: significance levels, power, and errors in inference
demonstration: levels of significance and critical values
demonstration: null hypothesis and type I and type II errors

end of material covered for In Class Exam I

Mon. Oct. 1
Review for In Class Exam 1
Wed. Oct. 3
In Class Exam I: covers questions in sections I-VI

Lectures 13-16 chap. 226-227; chap 8 202-204
demonstrations: power
demonstration: relation between power and alpha
demonstration: relation between power and the differences between means
demonstration: relation between power and sample size
demonstration: relation between power and sample size and variance
demonstration: central limit theorem

Lectures 17-18 chap 10 241-247, 251-253
independent group t-test
demonstrations: sampling distribution of mean1-mean2, M1-M2 (t-statistic)
demonstration: sampling distribution of the differences between means and t-scores
demonstration: the effects of sample size on t distributions

Lecture 19-22 chap 14 352-267, 375-381
one way analysis of variance
demonstration: ratios of variances, VAR1/VAR2 (F statistic)

Lectures 23-25 chap 15 390-410
two way analysis of variance
demonstration: graph display of main effects and interactions
matching Anova summary tables and graphic presentation of data

dead of material for In Class Exam II

Mon. Nov. 5
Review Session for In Class Exam II
Wed. Nov. 7 and Fri. Nov. 9
In Class Exam II: 2 part exam
covers questions in sections VII-XI.

Lecture 26 chap 11 277-281
confidence intervals
demonstration: confidence interval

Lectures 27-29 chap 6,7 & chap 10 253-256
correlation and regression
demonstrations: scatterplot, regression, and correlation
prediction of 'y' given 'x' from regression equation
standard error of the estimate and correlation

Lecture 30-31 chap. 116 428-435
chi square
demonstration: demonstration of the chi square (X^2) statistic
discussion of lab work for correlation and chi square

Remaining Lectures
Lectures and demonstrations related to the linear model which is the theoretical
foundation for t-tests, anovas, correlation, and regression.
chap. 14 353-365
demonstrations: relations between scores, means, and variances
demonstrations: linear composition of scores
demonstration: linear composition of sample scores
demonstration: population as set of linear composed scores
demonstrations: relation between the mean and variance
demonstration: sample: relation between estimated means and variance
demonstration: population: relation between estimated means and variance
demonstration: degrees of freedom
demonstrations: analysis of variance and linear model with populations
demonstration: linear model/composition of the experimental effect
demonstration: using ratios of variances (F scores) to assess differences in means
demonstrations: analysis of variance and linear model with samples
demonstration: sample means and scores
demonstration: linear model/composition of scores
demonstration: calculation of sums of squares and anova
demonstration: degrees of freedom

Tue. Dec. 18 3:00 PM (Primary Final Time) no alternate final
In Class Exam III: questions drawn from section XII-XVIII.

Exams/Quizzes (TOTAL POINTS=300):

There will be three (100 point) exams/quizzes in the course, each consisting of
an in class essay exam and a take home laboratory quiz.
IN CLASS EXAMS  In class exams will consist of items taken from the potential
exam questions listed in the Class Pack. The questions will be identical to or
reasonable paraphrases of questions the Class Pack.  TAKE HOME QUIZES  The take home
quiz portions of the 3 exams will require use of microcomputers, the Unix/Stat pack,
(statistical) niches, and the sampling program. The laboratory classes will cover
everything that will be required for these exams items.  Of course all work in the
course assumes that you are working within the Vanderbilt Honor Code but I want to
especially emphasize that the
Take Home Quizes assume the Vanderbilt Honor Code; do your own work; if you have
questions ask me or the TA's.

Penalties for unexcused absences or late exams: 10% will be deducted for each unexcused
absence from an in-class exam or late take-home exam if the work is made up within 1 week of the due date; 20% will be deducted if the work is made up more than 1 week after the due date.

Grades will be determined by points on the exams with the following grade ranges for the final grades:

- 294-300 pts. = A+
- 278-293 pts. = A
- 271-277 pts. = A-
- 264-270 pts. = B+
- 248-263 pts. = B
- 241-247 pts. = B-
- 234-240 pts. = C+
- 218-233 pts. = C
- 211-217 pts. = C-
- 204-210 pts. = D+
- 188-203 pts. = D
- 181-187 pts. = D-
- < 181 pts. = F