San Diego State University • Department of Psychology

Spring 2011

PSY470: Intermediate Statistics

GMCS-428, Tuesdays 4:00- 6:40 p.m.

Instructor:
B. Charles Tatum, Ph.D.
(619) 226-7726 (voice)
(619) 222-0831 (fax)
NOTE: Do not call or fax after 9:00 p.m.
ctatum13@cox.net (email directly using this address rather than through Blackboard)
Office Hours: 3:00-3:30 p.m., LS 24B, Thursdays

Textbooks

Furlong, N.E., Lovelace, E.A., & Lovelace, K.L. (2000). *Research Methods and Statistics*. New York: Harcourt College Publishers.

Huck, S.W. (2008). *Reading Statistics and Research (5th Ed.)*. New York: HarperCollins.

Course Description

A study of the methods, procedures, and techniques used to conduct empirical research. Design of research will be covered including philosophy of science, forming research questions, ethics in psychological research, psychological constructs, operational definitions, and strategies for experimental, quasi-experimental, and survey research. Descriptive and inferential statistics will be covered including hypothesis testing, sampling distributions, group analyses, confidence interval estimates, post hoc analyses, power estimation, correlation, regression, and statistical control. Emphases will be given to the use of SPSS in multiple regression, analysis of variance, and testing models of mediation and moderation. Statistical approaches to causal modeling and measuring change will also be covered.

Course Organization

The course is organized in a series of steps that allow the student to be exposed to the material and work with the concepts in an iterative process. The student should first read the assigned material in the textbooks prior to class. The instructor will go over the critical concepts and principles in class. The student will then be given a class exercise designed to allow the student to apply what he or she has learned. The following class session will begin with a short quiz (objective-type questions) that covers the material from the previous class. Finally, students will be given a midterm and a final exam that requires them to use the statistical concepts and principles to analyze a real data set. This class organization allows for multiple exposures to the material and provides several opportunities for students to apply what they have learned.

Course Goals

To increase the student's ability to critically analyze and interpret concepts related to:

a) The philosophy of science applied to the science of psychology.
b) The design of experimental, quasi-experimental and survey research.
c) The ethics of psychological research.
d) Descriptive and inferential statistics.

e) The formation and testing of research hypotheses, estimating effect sizes, and forming confidence interval estimates.
f) Correlation and regression analyses.
g) Assess threats to internal and external validity.
h) Use SPSS in analyzing research data, particularly in doing multiple regression, analysis of variance, and in testing models of mediation and moderation.
i) Conduct meta-analyses and causal modeling, and measure and analyze change.

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

a) Assess critical concepts and practices for the design of research.
b) Evaluate research designs and statistical analyses for appropriateness and effectiveness in answering the research question.
c) Summarize and analyze data and make statements about differences among groups and relationships among variables.
d) Apply techniques concerning statistical tests, effect size estimation, and establishing confidence intervals.
e) Assess critical concepts and practices for the internally and externally valid design of research.
f) Evaluate qualitative and case study research designs for appropriateness and effectiveness in answering the research question.
g) Use SPSS in analyzing research data, particularly in doing multiple regression, analysis of variance, factor analysis, and in testing models of mediation and moderation.
h) Determine the appropriate level of analysis in answering research questions and develop data collection sources in consonance with the level of analysis.

Homework Exercises and Quizzes (50%): During each class there will be a homework exercise and a short quiz to test and evaluate your understanding of the material. It is important to attend each class and keep up with the reading so you can perform optimally on these assignments. You may work on the homework exercises in groups if you prefer, but the written work must be submitted by you in your own words. I will try to allow some time at the end of the class session for you to get started (and maybe even finish) the homework. Performance on quizzes and homework exercises will determine half of your grade. **There will be a 10% penalty for work turned in late without prior approval (see Policy 2 below)**.

Midterm and Final Exam (50%): The midterm and final exams will be take-home exams due on class sessions 9 and 16 (the date for the final exam) no later than 30 minutes beyond the start time for the class. **There will be a 10% penalty for exams turned in late (see Policy 2 below)**. The exams will require a comprehensive review of material taken from the class and the textbook. You may work in groups to conduct and interpret the analyses, but the final reports must be written entirely by each student in his or her own words. Because of potential problems with receiving electronically submitted work (e.g., corrupted files, incompatible software, internet failures), **you must turn in a hard copy. I will not accept exams submitted electronically.**

Course Policies

1. All grades are final. Please do not ask your instructor to change a grade unless there clearly has been a recording error.

2. If you must miss a class, or cannot turn in an assignment on time, please notify your instructor in advance. There will be a penalty assessed (up to 10 percent of your grade) for late work that does not have prior approval from the instructor.
3. Your grade will be determined by the in-class assignments, quizzes, and take-home exams only. Extra credit is not an option for improving your grade in this class.
4. Blackboard: The syllabus and other course materials are posted on Blackboard. I will use PowerPoint slides in class. If you want hard copies of these slides please download them from Blackboard. Your exam and homework scores will also be posted on Blackboard. Important class notices will appear occasionally, so logon to Blackboard frequently. For the best results, please email me at the address listed on the syllabus (ctatum13@cox.net) and avoid going through Blackboard.
5. Office Hours: I am a part-time instructor and my on-campus office hours are limited. I will be in LS 24B from 3:00-3:30 on Thursdays. If you need to contact me outside of class, you may call me at home. If you need to see me in person, we can arrange to meet 30 minutes before class or immediately after class or during my short office hours/.
6. If you would like your final returned to you at the end of the semester, give me a self-addressed, stamped envelop and I will mail it to you.

Class Schedule

Class	Date	Content	Class Preparation
1	Jan 25	Introduction & Ethics	Furlong, Lovelace & Lovelace, Chps 1& 2, Appendix A (pp. A21 – A26 only)
2	Feb 1	Variables	Furlong, Lovelace & Lovelace, Chps 3 & 4 (pp. 56-66, 72-77 only)
3	Feb 8	Descriptive Statistics	Furlong, Lovelace & Lovelace, Chp 5 Huck, Chp 2
4	Feb 15	Research Methods & Hypothesis Testing	Furlong, Lovelace & Lovelace, Chps 6 & 7 Huck, Chps 5 (pp. 99-113 only), Chp 6 (pp. 125-133 only), Chp 7
5	Feb 22	One and Two Group Tests	Furlong, Lovelace & Lovelace, Chp 11 Huck, Chp 6 (pp. 133-143 only); Chp 10 (pp. 226-240, pp. 248-257 only)
6	Mar 1	Analysis of Variance I	Furlong, Lovelace & Lovelace, Chp. 12 (pp. 343-352 only) Huck, Chp 11 (pp. 259- 276 only)
7	Mar 8	Analysis of Variance II	Furlong, Lovelace & Lovelace, Chp. 12 (pp. 353-367 only) Huck, Chp 13 (pp. 306-324 only), Chp 14
8	Mar 15	Power, Magnitude & Confidence	Furlong, Lovelace & Lovelace, Appendix C (pp. C1 – C14 only) Huck, Chp 8

9	Mar 22	**Midterm Exam Due (NLT 4:30 p.m.)** Post Hoc Analysis	Furlong, Lovelace & Lovelace, Chp. 12 (pp. 367-373 only) Huck, Chp 12
	Mar 29	**Spring Break No Class**	**Spring Break**
10	Apr 5	Correlation & Regression	Furlong, Lovelace & Lovelace, Chp 8 (pp. 185-197 only) & Chp 9 (pp. 213-241 only) Huck Chp 3, Chp 9, Chp. 16 (pp. 406-418)
11	Apr 12	Statistical Control	Huck, Chp 15
12	Apr 19	Reliability, Validity & Scale Construction	Furlong, Lovelace & Lovelace, Chp. 4 (pp. 66-72 only); Huck, Chps. 4
13	Apr 26	Multiple Regression I (Basic Concepts)	Furlong, Lovelace & Lovelace, Chp. 9 (pp. 242-248 only)
14	May 3	Multiple Regression II (Coding and Hierarchical Regression)	Huck, Chp. 16 (pp. 418-428 only)
15	May 10	Potpourri of other Statistical Techniques	
16	May 17	**Final Exam Due (NLT 4:30 p.m.)**	