

Statistical Design for Behavioral Science I

Course Syllabus

Psychology 657 (56-6570)
Rensselaer Polytechnic Institute
Fall term, 1990-91

Instructor

Michael S. Wogalter
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Class Meetings

Monday and Wednesday
6:00 - 7:20 P.M. in Sage 2707
Lab (56-6571): Thursday
5:00 - 6:00 P.M. in Sage 4711

Office Hours

Mondays and Wednesday
5:05 - 5:50 P.M.
Thursday 6:05 - 7:15 P.M.

Teaching Assistant: Todd Barlow
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Office hours: TBA

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Department Staff: Jean Bestle, phone: 276-6472

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Course Objectives

1. The student should be able to define the basic terms used in the research process in the behavioral sciences including terms in the subareas of research design, measurement, and statistical analysis.
2. The student should be able to read, interpret, and critique the reports of experimental research investigations appearing in the behavioral sciences literature.
3. The student should be able to design simple investigations when presented a research question considering type of investigation, measurement of variables, ethics of the situation, and controls.
4. The student should be able to analyze the data generated in a simple investigation and to interpret the findings. The student should be able to recognize and articulate basic research designs, and be able to conduct the appropriate statistical analyses for the basic designs including tests of assumptions, major analyses, and appropriate subanalyses.
5. The student will learn and develop computer-assisted statistical analysis skills. The student should be able to use the SPSSx statistical analysis system on the MTS operating system using IBM's mainframe computer to store, manipulate, and analyze data. The student should be able to transfer, store, manipulate, and analyze data on a microcomputer.
6. The student will develop appropriate writing skills for the communication of research in psychology. The student should be able to use the American Psychological Association Publication Manual for the writing process. The student will develop library search and word processing skills.

Honorable Behavior

Students are expected to act with integrity. Exams will be closed book. No other materials other than the exam, a calculator, writing instruments, a formula sheet provided by the instructor, and extra paper will be allowed on desks. Mutual assistance between classmates on the lab and homework is allowed (and encouraged), but copying of someone else's written and computer work is not allowed. All written assignments (papers and the lab write-ups) should be entirely the student's own work.

Texts

- Keppel, G. (1982). *Design & analysis: A researcher's handbook* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Spatz, C., & Johnston, J. O. (1989). *Basic statistics: Tales of distributions* (4th ed.). Monterey, CA: Brooks/Cole.
- SPSS Inc. (1984). *SPSSx basics*. Chicago: Author.
- SPSS Inc. (1988). *SPSSx users guide* (3rd ed.). Chicago: Author.

In addition to the texts, handout notes will be given out by the instructor. The student should acquire a large loose-leaf notebook to hold programs, old homeworks and various paper materials handed out in class. If the student does not already own a copy of the *Publication Manual of the American Psychological Association* (3rd ed., 1983), the student is advised to purchase a copy. Access to a calculator for exams and homework is required.

Course Requirements

Laboratory Work

The student is required to complete 10 laboratory assignments. The lab write-ups are due at 6:00 P.M. on the Wednesday (beginning of class) of the week following the assignment. The lab assignments will be made on the preceding Wednesday and may be completed at any time during the week. Students may use the computer facilities at RPI including those in Carnegie Hall, Sage Hall, Folsom Library, or Voorhees Computing Center. Each laboratory assignment will be graded on a 10-point scale and the composite grade for all labs will account for 30% of the final course grade. One lab (with the student's lowest score) will be dropped from the final lab grade and replaced with the student's highest lab grade. Late labs will be assessed an automatic penalty equal to 10% of the lab grade per day and will not be accepted after 7 days following the due date. Make sure that you allow enough time to complete the labs before they are due.

Exams

The student is required to sit for four exams. The dates appear on the calender. Exam I will be worth 5% of the final course grade. Exams II and III will be each worth 15%. Exam IV is worth 20% and will be given during the scheduled final exam period (date TBA). The exams will be based on the texts, hand-outs, and the lectures. Though the exams will tend to be based on newer material, all exams are cumulative. All students are required to take the exams of the dates specified on the calender. Late exams will be assessed an automatic penalty equal to 25% of the exam grade per day.

You are strongly encouraged to read the assigned readings before each class and to reread them afterwards. Review and study your notes prior to coming to every class. It is recommended that you take handwritten notes of the texts as you read them. Save and organize all notes, programs, etc., for use in future classes, research, and thesis.

Papers

Two short papers are required. The papers should be constructed on a word processor in the style directed by the *Publication Manual of the American Psychological Association* (i.e., APA style). The first paper is a rewrite of an existing article into manuscript format. The second paper is a short literature review and or research proposal on some topic. Paper topics must be approved by the T.A. or the Instructor by the deadline stated on the course calender. Together, the papers will account for 15% of the final course grade. Late papers will be assessed an automatic penalty equal to 5.0% per day.

Attendance Policy

The material in this course is cumulative, building each day upon knowledge assumed from previous sessions. Understanding of most concepts and applications requires successful negotiation of earlier material. Therefore, the student is expected to make every effort to be in class each day (on time) and complete work for each assignment by the due dates. Because of the nature of the course, missing any work for this class will make things extremely difficult. Other than excused absences, penalties for absences will be enforced by strict adherence to deadlines for work assigned. Excused absences will be limited primarily to verifiable medical, legal or meteorological reasons. There may be legitimate excuses other than these and the instructor or T.A. will rule on these individually. Of course, if you missed class you are responsible for the material covered in lecture and any assignments made when you are absent. Take the necessary precautions to avoid getting sick, breaking the law, etc. More than 3 unexcused absences will result in an automatic penalty of one letter-grade on the final course grade.

When work is missed because of an excused absence, make-up must be made by the class meeting following the missed session unless previously arranged with the instructor. Students anticipating missing class because of an excused academic-related activity are expected to complete work before the due date. Some of the excuses that are not considered legitimate include (but are not limited to): (1) ride leaving early, only available flight, etc., (2) party or other social event, and (3) forgot the exam, lab, or paper due date.

Grad Stat Calender

Aug 29	Course introduction	
Aug 30	Lab 0: Intro MTS & computer accounts	
Sept 5	Behavioral science investigation Types of research, variables	Spatz & Johnston: Chap 1, Appendix B SPSSx Basics: Chap 1-4
Sept 6	Lab 1 & MTS Tutorial	
Sept 10	Measures of central tendency, Frequency distributions	Spatz & Johnston: Chap 2, 3
Sept 12	Measurement & description of data Measures of variability I	SPSSx Basics: Chap 5,6,9,11,13 SPSSx Users Guide: Appendix B
Sept 13	Lab 2 (Mac Guided Tour)	
Sept 17	Measures of variability II, Distributions	Spatz & Johnston: Chap 3, 5
Sept 19	Sampling, research reporting, ethics	SPSSx Basics: Chap 10,12,14,15, 17
Sept 20	Lab 3	SPSSx Users Guide: Chap 1,2,3,26,29
Sept 24	Sampling distributions	Spatz & Johnston: Chap 6
Sept 26	EXAM 1	SPSSx Basics: Chap 16,18,19,20
Sept 27	Lab: Word processing	
Oct 1	Confidence intervals, Design critiques I	Keppel: Chap 1
Oct 3	Experimentation, inferential statistics, diff between means	Spatz & Johnston: Chap 7
Oct 4	Lab: Statview intro	SPSSx Users Guide: Chap 4, 5, 7, 8, 9
Oct 15	PAPER 1 DUE, hypothesis testing	Keppel: Chap 4
Oct 17	t-tests	Spatz & Johnston: Chap 7, 8
Oct 18	Lab 4	SPSSx Users Guide: Chp 10,11,14,15,31,47,49
Oct 22	Validity, Reliability, Correlation	Spatz & Johnston: Chap 4
Oct 24	Simple linear regression	SPSSx Users Guide: Chap 24,37, 41,45,46
Oct 25	Lab 5	
Oct 29	EXAM 2	
Oct 31	Linear Model, One-way analysis of variance	Keppel: Chap 2, 3, 5
Nov 1	Lab: Computer graphing	Spatz & Johnston: Chap 9 SPSSx Users Guide: Chap 20, 39
Nov 5	One-way between-subjects ANOVA	Keppel: Chap 6, 8
Nov 7	Comparisons among means, planned & post hoc	
Nov 8	Lab 6, PAPER 2 Topic Approval DEADLINE	
Nov 12	Two-way between-subjects ANOVA I, Interaction	Keppel : Chap 9,10,11
Nov 14	Two-way between-subjects ANOVA II	Spatz & Johnston: Chap 10
Nov 15	Lab 7	SPSSx Users Guide: Chap 34
Nov 19	EXAM 3	
Nov 20 - 25	THANKSGIVING BREAK	
Nov 26	Multi-way between-subjects ANOVA	Keppel: Chap 13,14,15 16,17
Nov 28	One-way within-subjects ANOVA	SPSSx Users Guide: Chap 33
Nov 29	Lab 8	
Dec 3	Multi-way within-subjects ANOVA	Keppel: Chap 18, 19
Dec 5	Mixed-model ANOVA	SPSSx Users Guide: Chap 33
Dec 6	PAPER 2 Due, Lab 9	
Dec 10	Chi-square	Spatz & Johnston: Chap 11, 12
Dec 12	Nonparametric statistics, small-N designs	SPSSx Users Guide: Chap 25, 38
Dec 13	Lab 10	
Dec 17-21	FINAL EXAM PERIOD (EXAM 4)	