

STATISTICS AND RESEARCH DESIGN
Spring 2011
Psychology 418 Unique #43670, 43675

Lecture: MWF 11:00-11:50 NOA 1.116

Lab 43670: Thur 11:00-12:45 SEA 2.114

Lab 43675: Thur 11:00-12:45 SEA 2.122

Instructor: James E. Spivey, Ph.D., SEA 5.104, Phone: 475-6836.
E-mail: spivey@psy.utexas.edu
Office Hours: MWF 12:00 – 12:45, Thur 8:30 – 9:00 or by appointment

Teaching Assistants: To be announced at first class meeting.

Texts: American Psychological Association. (2001). PUBLICATION MANUAL OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION (5th ed.). Washington, DC: Author. ISBN # 1-55798-791-2

Jackson, S. L. (2008). STATISTICS AND RESEARCH DESIGN (Special edition, custom text). Mason OH.: Cengage.

Course Objectives: Students will acquire an appreciation for, as well as some knowledge of, the scientific method as it is applied within the field of psychology. Students will learn to critically evaluate published research, to form empirically testable hypotheses, and to design and conduct experiments relevant to those hypotheses. Students also will learn to employ computers to statistically describe and evaluate experimental data. Considerable emphasis will be placed on the writing of research reports with clarity and objectivity.

Prerequisites: The Psychology Department will drop all students who do not meet the following prerequisites: C or better in Psy 301; credit for Math 302 or higher level math course; major in Psychology.

Attendance: Roll will be taken at each class and lab meeting. Note that a great deal of the course material is not in written form and must be acquired through attendance. Attendance at every lecture and lab meeting is required. Missed work for lecture and lab may be made up only for those with excused absences.

Grade Procedure and Examinations: The course grade will be based on the total of the lecture and laboratory points. The lecture and the laboratory portions of the course each contribute a possible 300 points to a possible course total of 600 points. The points for the lecture portion will be based on three “hour” exams, each covering about one-third of the class material, an optional final exam, attendance, and quiz/homework assignments. The final exam will be divided into three sections, each representing one-third of the class material. A student may choose not to take the final exam and to have his/her exam grades determined by the hour exams.

A student may take one section of the final exam to improve (to replace) the grade earned on an hour exam plus any section needed to make up for an excused absence (e.g., illness or university-sponsored trip). A student with an unexcused absence for an hour exam may take that section of the final to improve the zero grade, but the hour exam zero is averaged with, not replaced by, the final exam section score. This latter student may also take any section needed to make up for an excused absence.

The final exam section score will be compared with the corresponding hour exam score, and the higher of the two scores will be recorded as the hour exam score (except for those with an unexcused absence). There will be no make-up for the final exam except in the most extreme cases such as hospitalization. If you wish to replace an hour exam score with the final exam score, DO NOT MISS THE FINAL EXAM!

The points for the lab portion of the course will be based on three research reports, quizzes, labwork, homework, attendance and participation for a possible total of 300 points. Lab TAs will discuss these assignments.

Work is due at the time class/lab is to begin. In lab, each of the three research reports will be penalized 10% for each day that it is late, including holidays, up to a maximum penalty of 40%. A weekend is counted as one day. After four days, the report will be assigned a grade of “0.” Other lab work cannot be turned in late. Lecture homework will lose one point for each day following the due date and cannot be turned in after the beginning of the lecture period following the due date (when the homework answers are usually given).

Grade Scale (Total points for lecture and lab combined):

Percent	Letter Grade	Points
92-100	A	549-600
90-91	A-	537-548
88-89	B+	525-536
82-87	B	489-524
80-81	B-	477-488
78-79	C+	465-476
72-77	C	429-464
70-71	C-	417-428
68-69	D+	405-416
62-67	D	369-404
60-61	D-	357-368
0-59	F	0-356

Lecture Schedule Spring 2011

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Date	Chapters in Text
Jan 19, 21	Chapter 1
Jan 24, 26	Chapter 2, pages 25 – 34 (To “Ethical Standards”)
Jan 28, 31, Feb 2	Chapter 5
Feb 4, 7, 9	Chapter 7 (Omit Conf Intervals, pages 165 - 167) (Omit Corr & Stat Sig, page 173)
Feb 11, 14, 16, 18	Chapter 9, pages 201 - 208
Feb 21	EXAM I: Material Jan 19 – Feb 18
Feb 23, 25	Chapter 9, pages 208 - 216
Feb 28 Mar, 2, 4	Chapter 10 (Omit page 225, beginning with “Calculations....”Omit through table on top of page 228. Omit table 10.5 on page 230. Omit pages 235 to Summary on page 242)
Mar 7, 9, 11	Chapter 11 (Omit page 256, beginning with “Calculations...”Omit through page 259. Omit Table 11.8 on page 260. Omit “Two-Way...” on page 265 to Summary on page 266)
Mar 14, 16, 18	S P R I N G B R E A K
Mar 21, 23	Chapter 2, pages 34 - 47
Mar 25, 28	Chapter 3
Mar 30, Apr 1	Chapter 4
Apr 4	EXAM II: Material Feb 23 – Apr 1
Apr 6, 8, 11	Chapter 8
Apr 13, 15, 18	Chapter 13 (Omit on page 293 “Effect Size...” to Summary on page 300)
Apr 20, 22	Chapter 6 (Omit on page 139 “Alternative...” to Summary on page 142)
Apr 25, 27, 29	Chapter 12
May 2	EXAM III: Material Apr 6 – 29
May 4, 6	Review for Final Exam
May 16	*Final Exam: Material Jan 19 – April 29

***Monday, May 16, 2:00 pm – 5:00 pm EXAM IV (FINAL EXAM) - All Lecture/Text Material**

LOCATION OF FINAL EXAM: To be determined by the University about two weeks prior to finals. At that time, the location will be announced in class. It also will be available from several electronic sources (see Registrar: Final Exam Schedule on line).

STUDENTS WITH DISABILITIES: The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. Info: Office of Dean of Students, 471-6259, 471-4641, TTY.

COURSE ABSENCE POLICY
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Examination Absence.

Absence from an examination is a very serious matter and will result in a grade of zero for the exam if the student's absence has not been excused by the instructor. Do not contact the TA concerning exam absences. You must contact the instructor, Dr. Spivey.

Hour Exams.

If at all possible, requests to be excused from an hour examination should be filed with the instructor prior to the examination. If a student is unable to file such a request prior to the exam (e.g., the student is in the hospital), the requisite medical excuse, signed by a physician or a mental health professional, will be due no more than three class days after the exam. I would expect a phone call or an E-mail even prior to that.

If the student's absence is excused by the instructor as described above, the missed hour exam may be made up as indicated in the syllabus. Note that the make-up policy discussed in the syllabus is only for those who take the original exam and for those whose absence from the exam is excused by the instructor.

Final Exams.

Absence from the final examination will NOT be excused except in the rarest case. The time of the final examination is indicated on the lecture schedule. The place of the exam will be determined later in the semester by U.T. Admin, and the location will be announced in class. Once grades are turned in, on the day following the final, grades cannot be changed except in the case of a computational error. No make-up can be scheduled once grades are turned in, regardless of the excuse. If a student encounters a severe emergency medical problem, the request for an excused absence must be filed with the instructor by the day of the exam by the student or another person acting for the hospitalized student.

Religious Holidays.

Students seeking an excused absence for the observance of a religious holy day must follow course policy. This policy states that notification must be made **IN WRITING** during the first two weeks of the term/semester. If the absence is to occur during the first two weeks of the semester or term, the notification must be given on the first class day. The notification, **IN WRITING**, must be delivered personally to the instructor. The notification then must be signed and dated by the instructor. Alternatively, the notification may be sent by certified mail, with a return receipt request, so that the notification reaches the instructor by the deadline indicated above.

Lecture/Laboratory Assignment Absence.

Absence from a lecture or laboratory assignment will result in a grade of zero if the absence is not excused.

Granting of Excused Absences.

An excused absence from a lecture assignment must be granted by the lecture instructor. An excused absence from a lab assignment must be granted by the lab instructor.

LECTURE ATTENDANCE POLICY

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Lecture attendance is required. This policy is in place to help students perform at their best. A great deal of the course material is not in the text, and students that do not attend lectures do not do well in this course.

The matrix below indicates the points available for attendance. Note that exams and holidays do not count toward the total of 39 attendance days. This total is based only on lectures.

Number of Lectures Attended	Unexcused Absences	Earned Points
36 to 39	0 - 3	12
34 to 35	4 - 5	6
0 to 33	6 or more	0

Excused Absence: Religious Holidays – Please see Course Absence Policy for Exams and Assignments on the reverse side of this page.

Excused Absence: Medical – A student will be granted an excused absence on medical grounds only if s/he provides a medical excuse, signed by a physician or mental health professional. This excuse must be delivered to Dr. Spivey within three days of the absence unless the student is in the hospital. An email or a phone call prior to that would be expected.

Excused Absence: University Service – A student representing The University of Texas will be provided with an excuse signed by a university official. That excuse should be delivered to Dr. Spivey in advance of the absence.

Personal Reasons: Attendance at a wedding or another personal event does not constitute appropriate grounds for an excused absence.

Allowed Unexcused Absences: After reading the above, it should be obvious that a student should save the allowable cuts for those days when s/he is not feeling quite well but cannot obtain a physician/s excuse or for those days when s/he wishes to be absent for personal reasons.

HOMEWORK
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For verbal problems, type your answers. For math problems, show your work on hand-written scratch pages, but put your answers to math problems on a typed answer sheet. All work on exams and homework is to be calculated to four decimal places. At the top left corner of the answer sheet please put your name, lab unique number, the date and the homework number. HW is due at the beginning of class. One point will be deducted beginning 10 minutes into the class period and for each business day that HW is late (weekends do not count for HW). HW cannot be turned in after the beginning of the next lecture when answers to HW are usually given.

1. List and describe (typewritten) with one or two sentences the six characteristics indicated in lecture of the scientific method and the six opposing characteristics of the common sense approach to understanding the world. Please put each of the twelve characteristics in a separate paragraph for ease of grading. (4 points, lecture)

Due Wednesday, January 26.

2. Chapter 5, Page 121, Problem #8: Change mean number of cups to 6 and standard deviation to 1.
(6 points, text)

Due Wednesday, February 2.

3. Chapter 9, Page 214, Problem #1 a, b, c, d, e.: Change scores by adding 7 points to each male score and subtracting 2 points from each female score. (6 points, text)

Due Monday, February 14.

EXAM I: Monday, February 21.

4. Chapter 9, Page 215, Problem # 3 a, b, c, d, e.: Change scores by adding 8 points to each 'after' score and subtracting 2 points from each 'before' score. Note: This is a Before/After Design and, for this special case, you always subtract the first score from the second to get a change score. Also, compute effect size even if F is not significant – in spite of what the text says. (4 points, text)

Due Friday, February 25.

5. Chapter 10, Problem Attached. (6 points, use lecture formulas)

Due Monday, March 7.

6. Chapter 11, Problem Attached. (6 points, use lecture formulas)

Due Monday, March 21.

EXAM II: Monday, April 4.

7. Chapter 8: Present the three developmental designs discussed in lecture. If the lecture has not covered them yet, note that these designs are inserted after page 200 of your text. Name each one, lay out the design (lay out the matrix), and give the major advantage and disadvantage of each one.

This assignment must be HANDWRITTEN. Do not type it. This is a change in policy for this HW only.

(4 points, lecture)

Due Monday, April 11.

8. Chapter 13, Problem Attached. (6 points, text)

Due Monday, April 18.

9. Chapter 6, Problem Attached. (6 points, text)

Due Monday, April 25.

EXAM III: Monday, May 2.

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Homework Attachment

1. Homework Problem #5, Chapter 10, **Due Monday, March 7, 2011**

The following data represent the results from an independent-measures experiment comparing three treatment conditions. Use an analysis of variance with $\alpha = .05$ to determine whether these data are sufficient to conclude that there are significant differences between the treatments. Complete a source table, record p, reject null?; compute Effect Size and do an HSD if justified.

	Treatment		
	I	II	III
1	5	5	13
2	5	5	17
3	6	6	18
5	10	10	19

2. Homework Problem #6, Chapter 11, **Due Monday, March 21, 2011**

For the following set of data:

- a. Compute the cell means and place them in an $A \times B$ matrix on typed cover sheet.
- b. Using the cell means, row means, and column means, state whether or not you think there will be an interaction of factors A and B , a main effect for factor A , and a main effect for factor B .
- c. Perform a two-factor analysis of variance for the data. Use $\alpha = .05$ to test each hypothesis in this analysis.
- d. Fill in a Source Table, record p, reject null?
- e. Compute Effect Size.
- f. Do HSDs as justified.

		Factor B		
		B ₁	B ₂	B ₃
Factor A	A ₁	1	4	12
		2	6	13
		2	9	17
		3	9	17
	A ₂	6	1	1
		8	2	2
		10	5	3
		11	8	3

3. Homework Problem #8, Chapter 13, **Due Monday, April 18, 2011**

You notice in your introductory psychology class that more women tend to sit up front and more men in the back. In order to determine whether this difference is significant, you collect data on the seating preferences for the students in your class. The data appear below:

	Men	Women
Front of the room	16	56
Back of the room	60	20

- a. What is χ^2_{obt} ?
- b. What is df for this test?
- c. What is χ^2_{cv} ?
- d. What conclusion should be drawn from these results?

4. Homework Problem #9, Chapter 6, **Due Monday, April 25, 2011**

In a study on caffeine and stress, college students indicated how many cups of coffee they drink per day and their stress level on a scale of 1 to 10. The data appear below.

Number of cups of coffee	Stress Level
9	10
8	9
7	8
6	7
5	4
4	4
2	3
1	1

Calculate a Pearson's r , using the computational formula, to determine the type and strength of the relationship between caffeine and stress level.

- a. obtained $r =$
- b. $df =$
- c. critical value of $r =$
- d. $p ?$, two tail test
- e. significant ?
- f. reject $H_0 ?$
- g. support $H_a ?$
- h. How much of the variability on stress scores is accounted for by the number of cups of coffee consumed per day?

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<u>Date</u>	<u>Lab #</u>	<u>Lab Schedule</u>
Jan 20	(1)	Introduction: Lab Orientation, Saving Files Introduce RR1 (Assign Groups, Topic Selection) PsycINFO & Library Research Training Introduce References Assignment 1 HW: Email attachment to TA by 5:00 pm tomorrow, January 21. APA Model paper revisions for Lab 2
Jan 21		Due: <u>Email Attachment</u>
Jan 27	NO LAB	Library week – NO LAB Work with your group on topic selection and finding articles
Feb 3	(2)	Due: <u>APA Model Paper</u> Lecture on APA Format, APA Manual (Chapters 1 & 2) Ethics, Plagiarism Work on RR1 Intro (Develop Hypothesis, Define Variables) HW: References Assignment 1 & study for APA Exam
Feb 10	(3)	Due: <u>References Assignment 1</u> APA Exam (Chapters 1 & 2) Helping Questionnaire Discuss Guidelines for RR1 Intro Announce optional draft RR1 Check-in with Groups (FINAL HYPOTHESIS & DEFINITIONS OF VARIABLES DUE)
Feb 17	(4)	Introduce RR1 Full Excel Training (Tabulation) FINALIZE METHOD Complete IRB Discuss data collection HW: RR1 Intro
Feb 24	(5)	Due: <u>RR1 Intro</u> Discuss Guidelines for RR1 Full Formatting Study Data in Excel SPSS Training (<i>t</i> -tests) Lecture on APA Format for Reporting Statistical Analyses HW: Data Collection for RR1 Full
Mar 3	(6)	Due: <u>Data for RR1 Full (Collected, Scored, and Formatted in Excel)</u> RR1 Data Analysis Excel Training (Graphing – Tables & Figures) Review APA Format for Reporting Statistical Analyses (<i>t</i> -test)
Mar 10	(7)	RR1 Intro Returned Presentations HW: RR1 Full
Mar 17	NO LAB	SPRING BREAK!
Mar 24	(8)	Due: <u>RR1 Full</u> Discuss Guidelines for RR2 Introduction to ANOVA Designs – NOT a Statistics Lecture ANOVA Packet (Main Effects & Interactions)

<u>Date</u>	<u>Lab #</u>	<u>Lab Schedule</u>
		Discuss RR2 (Assign Groups, Topic Selection, Preliminary Lit-search, Begin References Assignment) Work on RR2 with Groups (Hypotheses and Method) Group Member Peer Evaluations HW: References Assignment 2
Mar 31	(9)	Due: <u>References Assignment 2</u> Work on RR2 with Groups (FINALIZE HYPOTHESIS & METHOD) COMPLETE IRB SPSS Training (Two-way ANOVA) Formatting Study Data in Excel HW: Data Collection for RR2
Apr 7	(10)	Due: <u>Data for RR2 (Collected, Scored, and Formatted in Excel)</u> RR1 Full Returned RR2 Data Analysis (two-way ANOVA) Excel Training (Tables and Figures) Review APA Format for Reporting Statistical Analyses (ANOVA) Discuss Presentation Guidelines Work on RR2 (Analyze and Interpret Data)
Apr 14	(11)	Presentations Work on RR2 (Data Analysis & Interpretation of Results) Review of RR2 Expectations - Including Tables & Figures, & Sections' Contents HW: RR2
Apr 21	(12)	Due: <u>RR2</u> Course evaluations Chi Square Training Correlation Questionnaire Group Member Peer Evaluations LW: In Class Assignment (Chi Square)
Apr 28	(13)	Correlation Training LW: In Class Assignment (Correlation)
May 5	(14)	RR2 Returned & Lab Grades Assigned

Points for Lab (300 total)	
APA exam:	20
References assignment 1:	8
RR1 Intro:	45
Data RR1:	5
Presentation 1:	5
RR1:	70
References assignment 2:	8
Data RR2:	5
Presentation 2:	7
Chi Square:	4
Correlation:	4
RR2:	100
Lab attendance:	14
Participation:	5