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STAT 468: STATISTICS

PREREQUISITES:

Satisfactory completion of the math proficiency exams OR completion of either Intermediate or College algebra with a grade of "B" or better.

TEXTS:

Spence, J.T., Cotton, J.W., Underwood, B.J., and Duncan, C.P. (1990). *Elementary Statistics (5th ed.)*. New Jersey: Prentice-Hall, Inc.
Spence, J.T. (1988). *Work Book to Accompany Fifth Edition Elementary Statistics*. New Jersey: Prentice-Hall, Inc.

CALCULATOR:

You must have a calculator that computes the following statistics: the mean (\bar{x}), the standard deviation (s), sigma (σ), the sum of X (ΣX), the sum of X^2 (ΣX^2), factorials (N!), combinations (nCr) and permutations (nPr). Your calculator must also have at least one memory. I recommend the SHARP EL-531LB. (For sale at Office Max. It's about \$10.)

DESCRIPTION:

The course is intended to develop basic statistical skills for selection and application of descriptive and inferential statistical procedures. Emphasis is placed on the organization, analysis, and interpretation of research data from the social sciences. Descriptive topics include: data organization, distribution characteristics, indices of central tendency, and variability. Inferential topics include: sampling, hypothesis testing, and analysis of variance.

PURPOSE:

In this course, emphasis is placed on the conceptual understanding of statistics as tools used in behavioral research. The goal is to develop skill and competence in the choice and application of those tools so that the student can become an intelligent consumer of psychological research, or a beginning participant in experimental psychology.

RECOMMENDATIONS:

This course does not require mathematical sophistication beyond college algebra. The material is not difficult, but, for most of you it is NEW. It requires a different approach to studying than that used in your other classes. The content of statistics is sequential, that is, one builds on previous knowledge. Therefore, it is essential that one master the material step-by-step as you would mathematics or a foreign language. You must read the chapters in a timely fashion. Cramming simply will not work!

While you will not be expected to memorize formulae, you will have to know their meaning and application. Don't panic! For the exams you will be permitted to make yourself a one-page formula list and the decision tree found in the book (p. 334-335) into class with you. But, don't be fooled, you must still know how to access and apply procedures appropriately and interpret results of your analyses. This knowledge comes from intensive study, which requires time regularly budgeted and expended. You should spend no less than six (6) hours per week on this class (excluding the time you spend in the classroom). Form study groups!! Explain things to one another, plan regular meetings, and make sure everyone understands the material.

You are not in competition with your classmates. Mastery of the material is the name of the game.

It is to your advantage to have the assigned readings completed before they are covered in class. Class sessions are for the purpose of clarification, amplification, extension, and review. Prior reading enables you to maximize class time by having questions to ask for those purposes. Re-reading the material following class will help you to consolidate that which has been covered.



GOOD WEBSITES TO KNOW ABOUT:

Rice Virtual Lab in Statistics is found at <http://www.ruf.rice.edu/~lane/rvls.html>. It has a whole textbook on-line, with simulations and demonstrations, and an analysis lab.

The *Web Interface for Statistics Education (WISE)* is found at <http://www.projects.cgu.edu/wise/>. It has tutorials, definitions, links to other stat pages etc.

The *Internet Projects for Elementary Statistics* page is found at http://hepg.awl.com/weiss/e_iprojects/index.htm. It provides a set of simulations, demonstrations, and other activities.

Information about probabilities is provided by the *Chance Database*. It can be found at <http://www.dartmouth.edu/~chance/>.

If you're a Macintosh user, try the *MacStats Home Page* at <http://www.gsm.uci.edu/%7Ejoelwest/MacStats/>

TO SUBSCRIBE TO THE CLASS LISTSERV (S468-L):

Send an e-mail message to listproc@ecnet.net with the following in the body of the message

SUBSCRIBE S468-L <your name here>

REQUIREMENTS AND GRADING:

Midterm and Final. The exams will consist of multiple-choice questions. Each exam will have 25 questions on it. Each question will be worth 1 point. Thus, the two exams will be worth 50 points.

(Almost) Weekly Quizzes. Most weeks (see Class Schedule shown below) you will be given a quiz covering the previous week's material. There will be a total of 10 quizzes. Each quiz will consist of five questions. Each question will be worth 1 point. Thus, the ten quizzes will be worth a total of 50 points.

Optional Comprehensive Final. The optional comprehensive final will consist of 25 multiple-choice questions, each of which will be worth 1 point. It will cover material from the entire trimester.

Because even hard-working, well-motivated students differ in the rate at which they "catch on" to basic theoretical notions that are fundamental to much of the text material, having an optional comprehensive final allows all students a second chance to demonstrate their mastery of statistical concepts. Therefore, two sets of lecture grades are prepared, one based on the total points earned from the two required exams and the quizzes, the second based solely on the scores from the optional final exam. The official lecture grade will be whichever of these two is higher.

Grading. Grades will be assigned according to the following criteria:

90% or more of the possible points = A
 80 - 89% = B
 60-79% = C
 50-59% = D
 less than 50% of the possible points = F

NOTE:

I will not give "make-ups" for the final exams. If you do not take the midterm or one of the quizzes at the scheduled time, it will be your responsibility to make arrangements to take it before the next scheduled class period. I will give an incomplete only in the most extreme circumstances.

CLASS SCHEDULE

<u>Week Beginning</u>	<u>Lecture Topic¹</u>	<u>Homework/Exam Dates²</u>
Aug. 31	Syllabus. Study Skills Seminar. Introduction. pp. 1 - 14. The Use of Computers in Statistical Analyses. p. 339 - 344.	Section B: pp. 1 - 12. Section C: pp. 13-16.
Sept. 7	Frequency Distributions. pp. 16 - 29 Graphic Representations. pp. 30 - 46.	Section D: pp. 17-18. Section E: pp. 23-25. Quiz 1.
Sept. 14	Measures of Central Tendency. pp. 49 - 66.	Section F: pp. 33-38. Quiz 2.
Sept. 21	Variability. pp. 67 - 95.	Section G: pp. 45-51. Quiz 3.
Sept. 28	Probability. pp. 97 - 115.	Section H: pp. 61-66. Quiz 4.
Oct. 5	Binomial and Normal Distributions. pp. 116 - 135.	Section I: pp. 71-74. Quiz 5.
Oct. 12	Sampling Distributions: Single Samples pp. 137 - 164. Hypothesis Testing. pp. 93 - 96 (of workbook).	Midterm on 10/12/98 Section J: pp. 81-86.
Oct. 19	Sampling Distributions: Independent Populations. pp. 165 - 191.	Section L: pp. 97-102. Quiz 6.
Oct. 26	Sampling Distributions (Cont'd)	
Nov. 2	Correlation and Regression. pp. 194 - 225.	Section M: pp. 109-114. Quiz 7.
Nov. 9	Sampling Distributions: Matched Pairs pp. 228-239. Choosing the Correct Analysis pp. 327-338. Summary of Hypothesis Testing p 129 - 134. (of workbook)	Section N: pp. 123-125. Section O: pp. 135-137. Quiz 8.
Nov. 16	One-way ANOVA.	Section P: pp. 139-142. Quiz 9.
Nov. 23	One-way ANOVA (cont'd.). pp. 241 - 269. Two-way ANOVA pp. 271 - 278.	Section Q: pp. 147-148.

¹ The page numbers associated with the lecture topics refer to Spence et al.'s *Elementary Statistics* textbook.

² The page numbers associated with the homework assignments refer to Spence et al.'s *Workbook to Accompany Elementary Statistics*. All quiz dates will be on Tues. of the week they're scheduled to be given.

CLASS SCHEDULE

<u>Week Beginning</u>	<u>Lecture Topic¹</u>	<u>Homework/Exam Dates²</u>
	Thanksgiving is Nov. 26	
Nov. 30	Chi-square pp. 296 - 311. Probability. pp. 97 - 107.	Section R: pp. 159-161. Quiz 10.
Dec. 7		Final Exam on 12/7/98 Optional Final Exam on 12/9/98

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