

STA 313 ELEMENTARY BUSINESS STATISTICS  
Department of General Business  
Spring, 19\_\_  
Unique Number 03120 (9-10:30 TTH) GSB 363  
Unique Number 03130 (10:30-12 TTH) GSB 363

Professor: Dr. John (or Jane) Doe  
Office: GSB 527  
Phone: 471-0250  
Office Hrs: M 11-12, TTH 1-2:30, and by appointment

Text: Lapin, Lawrence L. *Statistics for Modern Business Decisions*, 3rd edition, Harcourt, Brace, Javanovich, Inc. (Required)

Clark, C.T., and Hunt, A.W. *STATPAK: Computerized Statistical Analysis*, 2nd Ed., Southwestern Publishing Co. (recommended)

Prerequisite: Math 603A, and B, or Math 603A and registration for Math 403K, or the equivalent.

Grading Components:

Homework	10%
Cases (2)	10%
Quizzes (2)	30%
Midterm	20%
Final	30%

Course Policies:

1. Homework

- \* There will be 22 homework assignments due on the dates shown on the schedule accompanying this syllabus.
- \* Late homework will not be accepted, but the 3 lowest homework grade will be dropped.
- \* You must show a complete solution (all steps and calculations) to receive credit for a homework problem; no credit will be given if the complete solution is not shown.
- \* Turn in your homework on eight and one-half by eleven inch loose-leaf paper; legal-size sheets, scratch paper, or pages torn from a spiral notebook will not be accepted. Circle all answers.

2. Cases

- \* Cases will involve constructive application of material covered in course and will utilize the University's Cyber Computer; no previous computer experiences is assumed. You will need to purchase a few (less than 50) computer cards.

3. Testing

- \* There will be two 75 minute quizzes given on the dates shown in the schedule attached. Quizzes will consist of conceptual questions, short-answer questions or problems, and problems for which the student will

show the complete solution. Each quiz will determine 15% of the student's course grade.

- \* No make-up quizzes will be given. If a student is excused from quiz 1 by the professor (for compelling reason) or if student scores higher on the midterm than on the first quiz, the first quiz grade will be dropped and the midterm will count 35%. Similarly, if a student is excused from quiz 2 or scores higher on the final than on the second quiz, the second quiz grade will be dropped and the final will count 45%.
- \* The uniform midterm examination will be given on Thursday, March 10, 19\_\_, 8:00-10:00 p.m. It will consist of 30 multiple choice questions and will cover material in the course up to that date.
- \* A comprehensive final examination will be given on the date published in the UT course schedule.
- \* You may bring one 8 and 1/2 by 11 inch page of notes to any test for your own use. You may use both sides of the sheet, but nothing larger than 8 and 1/2 by 11 inches will be permitted. Necessary distributional tables will be distributed with the test; no formulas will be provided. This policy applies to both quizzes, the midterm exam, and the final exam.
- \* A calculator will be extremely helpful on all tests. You are responsible for bringing your calculator and insuring that it is fully charged. If your calculator fails during a test, you will be required to finish the test without it. Sharing calculators will not be allowed.
- \* Cheating will result in a grade of F for that test and appropriate disciplinary action.

#### 4. Course grade assignment

- \* Each component of your grade (homework, projects, quizzes, midterm, final) will be assigned a letter grade reflecting relative performance. There is no College or University policy requiring the professor to "curve" the grades in certain circumstances.
  - \* To arrive at a final grade, the component letter grades will be averaged strictly according to the percentages given above. For this purpose, numerical equivalents to letter grades will be used (A=4, A-=3.67, B+=3.33, etc.). There will be no curve of final grades; that is, each grade is curved at most once.
  - \* No pluses or minuses will be reported for the course grade.
  - \* A course grade of incomplete, "X", will be awarded only in the most compelling non-academic circumstance, which must be documented in writing and approved by the professor no later than 24 hours after the scheduled final examination time.
  - \* Exam and course grades will not be posted. To receive a grade prior to notification by the university registrar, a student must leave a stamped, self-addressed envelope with the professor. Please note that an open-faced postcard does not fulfill the university's confidentiality guideline.
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### 5. Helpful Hints

- \* Students are responsible for assigned material in the text, whether or not that material is covered in class.
  - \* Students are responsible for material covered in class whether or not it is in the text.
  - \* A TA is available in the STA 313 lab, GSB 425, for help with the material in this course. A specific lab schedule will be announced.
  - \* The text, old midterm exams, computer manuals, and reference texts are on reserve in the Perry-Castañeda Library.
  - \* A study guide to accompany the text is available in the Co-Op.
  - \* The LSC (Learning Skills Center) provides a workshop on basic skills appropriate for STA 313.
  - \* Tutors are referred by the LSC and also by the STA 313 co-ordinator.
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## Schedule of Topics for Elementary Business Statistics

<u>Date</u>	<u>Topic</u>	<u>Text Reference</u> (Chapter.Section)	<u>Assignment Due</u>
Jan. 18		What IS/Are Statistics?	1.1-2.4
20*	Describing Data	3.1-3.5	1: 2-17, 2-19
25	The Dow Jones and the CPI	13.1-13.4	2: 3-9, 3-11, 3-17, 3-23
27	Adjusting for Inflation	13.5-13.7	3: 13-1, 13-2, 13-3
Feb. 1**		Is the Future Like the Past?	12.1-12.3      4: 13-3,
13-7,	Project Groups		
3	Seasonal Influences	12.4-12.5	5: 12-16
8	A Crystal Ball		6: 12-17, 12-18, 12-20
10***		QUIZ I	
15	What are the Chances?	5.1-5.3,5.7	7: 5-6, 5-8, Review prob.
17	A Case of Discrimination	5.4-5.6,5.8	8: 5-31. 5-14, 5-15, 5-16
22	Insurance Premiums	6.1-6.3	9: 5-33, 5-37, 5-53, Review prob.
24	True/False Tests	6.4-6.5	10: 6-1, 6-3; Review prob.
Mar. 1	Curving Grades	7.1-7.2	11: 6-29, 6-31, 6-35, 6-36
3	How Averages Vary	7.3-7.4	12: 7-1, 7-2, 7-3
8	Normal as a Good Guess	7.5	13: 7-9, 7-29, 7-22, 7-23
10	Case Work Day 1		
10	Midterm Exam 8-10 PM		
22	Bull's Eye or Ball Park	8.1-8.3	14: 8-3, 8-5
24****	Political Polls	8.4-8.5	15: 8-7, 8-11
29	Comparing Two Groups	14.1, 14.3	16: 8-33, 8-39
31	Innocent until Proven Guilty	9.1, 9.6,9.7	Case I
Apr. 5	Large or Small Samples	9.2-9.5	17: 9-32, 9-33, 9-34, 9-35
7		Significance	10.1-10.3
12	QUIZ II		
14	You've Got to Draw the Line Somewhere	10.4-10.6	18: 10-17
19	Variability of the Regression		19: 10-27
21	Case Work 2		
26	Correlation		20: Review Prob.
28	More Factors	11	Case II
May 3	Criteria for Choosing	19 & 20	21: 11-19
5	Looking Back		22: 19-13, 20-11, 20-12, 20-13, 20-14
10	FINAL EXAM (03120, 9-10:30)		(Room to be announced)
11	FINAL EXAM (03130, 10:30-12)		(Room to be announced)

\* Last day to add a course is Jan. 20

\*\* Last day to drop a course for possible refund is Feb. 1.

\*\*\* Last day to drop without possible academic penalty is Feb. 11.

\*\*\*\* Last day to drop or withdraw without dean's exception is March 25.

## OBJECTIVES FOR STA 313

**First Half**(Chapter references are to Lapin, 3rd edition.)

- I. Descriptive Statistics. The student will be able to:
- A. Understand and interpret the association between area under a frequency distribution and probability.
  - B. Compute the mean and standard deviation of a sample.
  - C. Use Chebyshev's Theorem to interpret standard deviation of a population.
  - D. Compute and interpret other descriptive measures (mode, median, range, percentiles, inter quartile range, etc.)

**Chapters 1, 2, 3**

- II. Index Numbers. The students will be able to:
- A. Compute and interpret an unweighted index.
  - B. Compute and interpret a weighted index.
  - C. Use price indexes to adjust data collected over time. Understand the applicability of common index numbers such as Consumer Price Index and the Dow Jones Average.

**Chapter 13**

- III. Time Series. The student will be able to:
- A. Identify components of the classical time series model.
  - B. Interpret a given linear trend equation and recognize when a non-linear trend is appropriate.
  - C. Interpret seasonal indexed for quarterly data in context, using them to deseasonalize data.
  - D. Make forecasts using trend equations and seasonal indexes.

**Chapter 12**

- IV. Probability and Probability Distributions. The student will be able to:
- A. Use the rules of probability to find the probabilities of applied events.
  - B. Determine conditional probabilities.
  - C. Determine whether events are independent. Compute and interpret the expected value and variance of a given discrete distribution.
  - D. Compute exact probabilities for binomial random variables.
  - E. Compute expected value and variance for a binomial distribution.
  - F. Compute expected value and variance for the sampling distribution of the sample mean.
  - G. Compute the expected value and variance for the sampling distribution of the sample proportion.

**Chapters 5 and 6**

- V. Normal Distribution. The student will be able to:
- A. Compute probabilities for a normal random variable.

- B. Find percentiles for a normal random variable.
- C. Compute probabilities for the mean of a normal random variable.
- D. Find percentiles for the mean of a normal random variable.
- E. Compute probabilities for the mean of a non-normal random variable using the Central Limit Theorem.
- F. Use the Normal Approximation to the Binomial Distribution to find approximate probabilities for the sample proportion.

### Chapter 7

#### Midterm Exam

#### Second Half

VI. Estimation. The student will be able to:

- A. Compute confidence interval estimates of the population mean based on large samples.
- B. Compute confidence interval estimates of the population mean based on small samples from a normal distribution with unknown variance.
- C. Compute confidence interval estimates of the population proportion based on large samples.
- D. Determine the confidence level of a given confidence interval based on large samples.
- E. Determine the required sample size.

### Chapter 8

VII. Hypothesis Testing. The student will be able to:

- A. Formulate null and alternative hypotheses from worded statements of applied problems.
- B. Compute probabilities for Type I and Type II errors for one- and two-tailed tests.
- C. Construct decision rules and tests for one- and two- tailed hypotheses about the mean for large samples.
- D. Construct decision rules and tests for one- and two- tailed hypotheses about the mean for small samples.
- E. Construct decision rules and tests for two-tailed tests about the proportion for larger samples.
- F. Describe in words the meaning of a Type I and Type II error for a given hypothesis in terms of the decisions made and the "true" state of the population.
- G. Perform hypothesis tests for two matched samples.
- H. Perform hypothesis tests for two or more independent samples.
- I. Recognize the appropriateness of Normal Theory tests and the existence of non-parametric tests when these are appropriate.

### Chapters 9, (14,15,17,18)

VIII. Regression and Correlation. The student will be able to:

- A. Construct a scatter diagram and describe the relationship.
  - B. Compute a least squares regression line.
  - C. Describe in words the meaning of intercept and slope.
  - D. Compute and interpret the standard error or the estimate.
  - E. Test hypotheses about the population slope.
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- F. Compute prediction intervals for the conditional mean.
  - G. Compute prediction intervals for a single observation.
  - H. Compute the correlation coefficient and describe in words what information it conveys about the relationship.
  - I. Compute the coefficient of determination and use it to choose candidate independent variables.
  - J. Interpret a given multiple regression equation.

**Chapters 10 (11)**

IX. Decision Theory. The student will be able to:

- A. Construct decision tables.
- B. Construct decision trees with payoffs and probabilities.
- C. Use backward induction to evaluate expected payoffs and make decisions.
- D. Use the minimax criteria to make decisions.
- E. Use maximum expected payoff criterion to evaluate alternative strategies.
- F. Calculate the expected value of perfect information and use this to make decisions concerning the acquisition of additional information.

**Chapters 19,20**

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## Final Exam

## STA 313 CLASS DATA

SPRING 19\_\_

Respond to these questions directly on this page. We will use this sample class data to answer questions about ourselves throughout the course. (Your responses will be anonymous--do not put your name on this page.)

1. Are you male or female? \_\_\_\_\_
2. How old are you? \_\_\_\_\_
3. What is your GPA at the beginning of this semester? \_\_\_\_\_

- |  | strongly<br>agree | agree | neutral | disagree | strongly<br>disagree |
|--|-------------------|-------|---------|----------|----------------------|
| 4. I am apprehensive about this course.  | _____             | _____ | _____   | _____    | _____                |
| 5. I would be apprehensive about using computers   | _____             | _____ | _____   | _____    | _____                |
| 6. Statistics is irrelevant to my career interest.   | _____             | _____ | _____   | _____    | _____                |
| 7. I have definite career plans.   | _____             | _____ | _____   | _____    | _____                |
| 8. How many children would like to have?<br>four or more__ ; three__ ; two__ ; one__ ; none__  |                   |       |         |          |                      |
| 9. If both husband and wife work full time, who should do the housework?<br>wife do all__ ; wife do most__ ; share half and half__ ;<br>husband do most__ ; husband do all__ .                 |                   |       |         |          |                      |
| 10. How do (or would) you feel about your spouse regularly drinking alcoholic beverages?<br>strongly against__ ; somewhat against__ ; neutral__ ;<br>somewhat in favor__ ; strongly in favor__ |                   |       |         |          |                      |

## STA 313 Elementary Business Statistics

## Questionnaire Spring 19\_\_

The purpose of this questionnaire is to assist your instructor in adapting this course to your needs. In no way will your responses affect your grade in this course or the instructor's evaluation of you. Please answer completely and as honestly as possible.

NAME: \_\_\_\_\_  
(Please use the name that you prefer to be called.)

INTENDED MAJOR: \_\_\_\_\_ CLASSIFICATION: \_\_\_\_\_

Local phone: \_\_\_\_\_ Local Address: \_\_\_\_\_  
(To be used only if I need to contact you in an emergency.)

Have you had any courses involving statistics prior to this one? If so, describe briefly.

Have you had any computer courses or other computer experience? Describe briefly or give UT course number.

On learning that your degree program requires this course, with what did you think statistics is primarily concerned?

NOTE: The following release should be signed ONLY if you are willing to have your grade posted by social security number. Your name will not be used.

\* \* \* Authorization for Release of Grade \* \* \*

I hereby authorize Dr. J. Doe to post or otherwise display publicly my final course grade, homework grades, and quiz grades, using only my social security number as identification, in STA 313, (03120, 03130), Spring 19\_\_.

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 Student's Signature

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 Student's Social Security #

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 Date

## STA 313 CLASS DATA

## CODEBOOK:

<u>Question</u>	<u>Variable Name</u>	<u>Values</u>
1. Are you male or female?	SEX	0 = male 1 = female
2. How old are you?	AGE	##
3. What is your GPA?	GPA	##
4. I am apprehensive about this course.	STFR	1 = Strongly agree
5. I would be apprehensive about computers.	CTFR	2 = Agree 3 = Neutral
6. Statistics is irrelevant to my career interest.	IRREL	4 = Disagree
7. I have definite career plans.	CARPL	5 = Strongly disagree
8. How many children would you like to have?	NCHLD	#, 4 = four or more
9. If both husband and wife work full time, who should do housework?	HWK	1= wife all 2= wife most 3= husband most 4= husband all
10. How do (or would) you feel about your spouse regularly drinking alcoholic		1= strongly against 2= somewhat against 3= neutral

beverages?

ABEV

4= somewhat in favor

5= strongly in favor

STA 313 CLASS DATA

Spring 19\_\_ (03120)

SEX	AGE	GPA	STFR	CTFR	IRREL	CARPL	NCHILD	HWK	ABEV
0	19	2.35	3	3	2	1	2	2	3
0	22	2.20	3	3	4	1	2	.	2
1	53	3.25	2	3	4	2	4	3	1
0	25	3.0	2	2	4	2	2	3	2
1	27	2.70	3	3	5	2	2	2	2
1	20	2.65	2	5	3	2	2	3	2
0	20	2.02	2	4	5	3	3	2	3
0	20	2.57	4	4	3	3	3	3	1
1	19	2.20	3	4	4	3	3	3	3
1	19	2.46	2	4	4	1	2	3	2
0	21	2.81	2	1	4	1	2	3	2
1	21	2.60	2	4	4	2	3	3	2
1	20	2.65	2	2	3	4	2	3	1
1	20	2.75	2	2	4	3	2	2	2
1	20	3.55	3	4	5	1	3	3	2
1	20	2.07	2	4	5	2	2	3	2
0	20	2.49	2	5	5	1	3	3	1
1	19	2.45	3	4	5	1	4	3	2
1	20	2.35	2	3	2	3	3	3	1
0	21	2.00	2	3	5	5	2	3	2
0	19	3.40	4	5	5	5	2	3	2
1	19	2.60	3	3	4	2	3	2	2
1	20	2.90	3	2	4	4	2	3	2
1	44	2.70	1	5	3	1	0	3	2
1	33	3.00	3	4	4	2	3	3	3
0	20	3.14	3	3	4	3	2	3	3
1	20	2.75	2	1	3	2	2	3	1
0	19	3.30	4	4	5	1	3	3	1
0	19	2.90	3	4	4	1	3	4	3
1	20	2.70	1	2	4	5	3	3	1
1	19	3.10	2	3	4	2	2	2	2
1	27	2.88	2	2	5	2	2	3	2
0	19	2.53	4	3	5	3	2	.	2
0	20	2.5	3	3	3	3	.	.	2
0	19	2.97	3	5	5	1	3	3	3
1	22	2.09	2	2	4	2	3	3	1
1	21	2.49	4	3	5	2	2	3	1
1	19	3.00	1	4	4	1	2	3	2
1	19	2.90	2	3	3	2	3	3	2
1	30	3.53	5	4	4	1	1	3	3
1	20	3.00	2	4	5	3	3	2	1
1	19	3.00	4	5	5	2	3	3	1
1	20	2.1	5	5	5	1	2	3	4