

**Course** **BUSN 2750: Introduction To Statistics**

**Term** Fall 2008

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**Catalog Description** Studies the logic of empirical research and statistical tools.

**Prerequisites** MATH 1430 or equivalent competence

**Learning Outcomes**

Outcome	Expectation
1. Students understand the basics of data collection and random sampling.	Students learn/review basic statistics concepts. Students will also learn about proper sampling methods, as well as common errors that occur during the sampling process.
2. Students understand how to create, use and interpret tables and charts.	Students will learn how to interpret data from tables and charts. Students should also be shown how to use Excel to create tables and charts for presentational purposes. Students should also be shown how tables and charts can be useful when assessing probabilities.
3. Students understand basic calculations of descriptive statistics.	Students learn basic descriptive statistics such as the mean, median, mode, variance, standard deviation, coefficient of variation, skewness, and coefficient of correlation.
4. Students understand the basics of probability.	Students will learn the difference between subjective, empirical, and a priori probability. Students will also learn a variety of probability rules.
5. Students understand the concept of random variables, as well as probability distributions for discrete random variables.	Students will learn how to calculate descriptive statistics for a discrete random variable. Students will also learn what a probability distribution is, as well as be introduced to other selected discrete random variables.
6. Students understand the basic properties of the normal distribution and sampling distributions in	Student will become familiar with the properties of a normal distribution, how to use Z tables, and how to apply the concepts of the normal distribution to that of sampling distributions.

general.	
7. Students construct confidence intervals and calculate sample size selection.	Students learn how to construct confidence intervals and learn how to determine the appropriate sample size for a particular study.
8. Students learn the methods of hypothesis testing.	Students learn how to use the scientific method of hypothesis testing, and students will also be exposed to both one and two tailed tests.
9. Students learn how to conduct regression analysis.	Students learn simple and multiple regression analysis, and then learn how to use regression results in a real-world setting.

**Textbook and other Materials**

*Stats: Data and Models*, De Vaux, Velleman, Bock, Addison Wesley/Pearson (2005).

**Grading**

Assignments	10%
Projects	15%
Tests (1 & 2)	30%
Final	38%
Quizzes	07%

**Activities**

Projects, assignments, demonstration of knowledge on tests and quizzes.

**University Policies**

**Cheating**

Any student found cheating on any part of the course work (homework assignment, term paper, quiz, exam, etc.) will automatically be given an “F” for the course. Any student found to be helping another student to cheat will likewise be given an “F” for the course. In each case, the student will also be put on disciplinary probation for the remainder of her or his stay at Webster. If the student is found to have engaged in cheating a second time, s/he will be automatically expelled from the University.

**Attendance**

Class attendance is obligatory. Instructors will take attendance at each class session and reduce a student’s course grade by one-third of a letter grade for each full week of class missed. Any student who misses four or more full weeks of class will automatically be given an “F” for the course.

**Course Policies**

See university policies

## Weekly Schedule

### Week 1:

Introduction to Descriptive Statistics, and Excel basics for statistics.

Reading will cover the first *four* chapters of the book and will cover Excel basics.

Assignment 1:

Part 1: Ch. 2: 11, 18, 21

Read Ch.3/4, and try #s 1 - 5, 8, 15

Part 2: Ch.4: 5, 18, 28, 32

Read chapter 4/5

Begin project selection.

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### Week 2:

Describing Data Numerically.

Reading will cover chapters 5, 6.

Assignment 2:

Part 1: Ch. 5: 19, 23, 33,

Part 2: Ch. 6: 13,25,32

Read chapter 4,5, 6.

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### Week 3:

Linear regression.

Reading will cover chapters 7, 8 and 9.

Assignment 3:

Ch. 7: 3, 8, 12, 13, 14, 16 (Use Excel for drawing scatter plots and for correlation)

Assignment 4:

Ch. 8: 17,22,28,38 + Sheet handed in class

Project Progress report 1: [by email]
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### Week 4:

Regression Wisdom, and randomness.

Reading will cover chapter 9 & review of regression. Read Ch. 11

Assignment 5:

Ch. 9: 11,17,20,21

plus Review exercises pp 207 - 216: 8,10, 15, 19, 33.

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Week 5:

Introduction to Randomness.

Reading will cover chapter 12, & 13.

Assignment: 12: No specific homework here since you need to read the chapter

Assignment: 13: No specific homework here since you need to read the chapter

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Week 6:

Test 1: Covers chapters 1 - 9.

Probability.

Reading will cover chapters 11, 12, and 13 [Only reading]. Reading and detailed discussion: ch. 14, & 15.

Assignment Ch.14: 6, 9, 11, 15, 17, 21, 24.

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Week 7:

Random variables.

Reading will cover chapters 16 &17.

Ch.15: 8,10,12,16,19,25,33,

Ch.16: 15,18,21,26,31,33 ,

Project Progress report 2 Due Tuesday Feb. 27
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Week 8:

Sampling and Estimation 1.

Reading will cover chapters 16,17.

Ch. 17: 11,12,17,21,30,33 &

Review part iv questions: 6, 7, 9, 11, 15, 17, 20, 22, 23

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Week 9:

Sampling and Estimation 2.

Reading will cover Chapter 18.  
Assignment:  
Ch 18: 7,10,13,17,18,21,23,28 + Investigation

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Week 10:

Hypothesis Testing I.  
Reading will cover Chapters 19, 20.  
Assignment: make sure you know chapter 18 and 19 well, and for HW:

Ch 19: 7,8,13,18,23

Project Progress report 3
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Week 11:

Hypothesis Testing II.  
Reading will cover Chapters 19, 20, 21.  
Assignment: make sure you know chapter 18 and 19 well, and for HW:  
Ch 18: 7,10,13,17,18,21,23,28  
Ch 19: 7,8,13,18,23, 25, 28, 30,32.

Test 2: Covers chapters 13 - 19.

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Week 12:

H-Testing III - 2 populations

Assignment: Read chapter 20, 21 for Tuesday, and 22 for Thursday.  
Ch. 20: 2, 6, 8, 10, 12, 18, 23.  
Ch. 21: 6, 8, 13, 16

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Week 13:

Hypothesis Testing IV.  
Reading will cover Chapters 24, 25, .  
Assignment:  
Choose 6 problems from each chapter: 22, 23, 24, 25, 26.

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Week 14:

Hypothesis Testing V  
Reading will cover Chapters 26, 27, 28

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Week 15:  
Reading will cover Chapters 29 & 30, Review and  
Final Exam: 18 - 28.

Project Final  
Report

Latest by Saturday

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Week 16:  
Projects' presentations.

## **Additional Information    Preparing Your Report**

- The purpose of the written report is to communicate your experience to others. Basically you're introducing the investigation or setting the stage, telling the reader what you did and what your results were, and what you learned from the investigation. You don't need to write out a step-by-step listing of the Minitab commands you used. Rather, you should describe in general terms what you did, why you did it, and what your results were. Pretend that you are writing for an intelligent person, but one who may not be up to speed on contemporary statistics.
- Your report should be word processed (if possible and convenient), and should begin with a title and your name(s). With regard to format, it must include the following components. The first section should be headed "Introduction" and should state the purpose of your investigation (i.e: Look at the first paragraph of the particular special problem assignment sheet). The second part should be headed "Analysis" and should briefly describe what you did or the steps you went through to investigate the phenomenon. This section should include all relevant graphs and numerical calculations and other results of your investigation. The "Summary or Conclusions" section should describe the insights that you got from conducting this investigation or the conclusions you drew from it.
- In order to achieve some uniformity in the reports, you should use a font like the one you're reading now (Times New Roman, Bookman, New Century Schoolbook, etc.), depending on what's available on your computer. Put the title in 18-point size to make it stand out, and the rest of your report in 11-12 point. Put your name after the title and before the narrative, with appropriate spacing.
- You should single-space within paragraphs and double-space between paragraphs. Use 10-point size Courier type style for all Minitab output, because the numbers line up nicely. You should have the computer number your pages, not including the title page. A general rule of thumb for the length of your report for most Special Problems is 4-8 pages, depending on your particular style of exposition and the number of computer plots you include.

### **Grading.**

In grading your projects, attention will be given to the following considerations:

- Did you follow instructions for the investigation? Did you use the correct procedure?
- Are your results reasonable? Does your report have all the required components (sections)?
- Are your conclusions reasonable? Justified?
- Is your report grammatically correct and free of spelling errors?
- Did you submit your project on time?
- Does your report demonstrate statistical concepts properly?
- Did you communicate your ideas clearly? i.e. is the report clear and unambiguous?
- Does your report show evidence of time spent in preparation?
- Does your report include charts, tables, and/or graphs where appropriate?

### **Project Evaluation Scheme**

The points on this scheme add up to 30 marks. The total score will be divided by 2 and then added to the course grade to represent the 15% allocated to the project.

**A. Statement of Task 3 points**

A clear statement of the task is produced and a description of the plan by which it will be carried out, this plan being well focused.

· *To achieve the maximum level the plan must have sufficient scope to enable the authors to produce relevant measurements, information or data.*

**B. Data Collection 3 points**

The candidate collects information or data relevant to the defined task and organizes the data in a form appropriate for analysis, the data being **sufficient** in both quality and quantity.

· *The maximum level cannot be achieved if the information or data are too sparse (ie insufficient in quantity) or too simple as clearly such data does not lend itself to being structured. It should therefore be recognized that within this descriptor there are assumptions concerning the quantity and, more importantly, the quality (in terms of depth and breadth) of data collected/generated.*

**C. Analysis 5 points**

The authors carry out simple statistical processes correctly and make accurate use of a **wide range** of more sophisticated techniques which are relevant to the stated task.

· *To achieve the maximum level the authors would be expected to have carried out as wide a range of **meaningful** statistical processes as possible, although they may all relate to a single area of statistics, for example, estimation. Measurements, information or data which are limited in scope would not allow the authors to achieve this level.*

**D. Evaluation 5 points**

The authors produce thorough interpretations and conclusions which are consistent with the analysis, and comment **critically** on the validity of the statistical processes used and the results obtained.

· *The maximum level requires a level of sophistication and understanding of validity that demonstrate deep understanding of the task and the statistical processes behind it. One or two sentences discussing the validity of the project would not be sufficient to achieve this level .*

**E. Structure and Communication 5 points**

The authors have structured the project by systematically recording actions at each stage using appropriate statistical language and representation in a **clear and coherent manner**.

· *To achieve the maximum level the project would be expected to read well. The implication here is that a higher degree of sophistication is required.*

**F. Commitment 5 points**

The authors showed **outstanding** commitment.

· *For example, the authors took initiatives both in discussion with the teacher and in subsequent work of a more independent nature and/or demonstrated a full understanding of all the steps in the development of the project. In order to obtain the highest achievement level for this criterion the authors should have excelled in areas such as those listed below.*

*The authors:*

- *actively participated at all stages of the development of the project*
- *demonstrated a full understanding of the concepts associated with the project*
- *demonstrated initiative*
- *demonstrated perseverance*

- *showed insight*
- *prepared well to meet deadlines.*

***G. Presentation 4 points***

The presentation must meet the requirements stated in the course description

