STAT 200
Basic Statistical Practice
On-Line Course, Spring 2008

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Web page on WebCT

Office Hours: The Instructor can be contacted directly by voice mail or e-mail. I encourage you to ask questions via e-mail for the quickest response.

Required Text:  Mind on Statistics, 3rd Edition
Jessica M. Utts - University of California, Davis
Robert F. Heckard - Pennsylvania State University

COURSE DESCRIPTION: Statistics are an important part of both physical and social science research. They enable us to examine and test important research questions concerning individual variables and relationships among a set of variables. The focus of this course is on understanding the basics of statistics. I would like you to gain an appreciation for how descriptive and inferential statistics are used in everyday life and in research; how to analyze a set of data; and how to critique the use of statistics by others.

STAT 200 On-Line is designed to give the students an appreciation and understanding of the use of descriptive and inferential statistics. This course assumes that the students have not had any prior exposure to statistics. This course will be very much a hands on course. We are going to get down and dirty with the data. I firmly believe in looking at univariate statistics, graphing and plotting data, and in students interpreting the results. I will encourage the use of Microsoft Excel for calculations, but I will also require some hand calculations (on small data sets).

COURSE OBJECTIVES:

1. Understand the use of statistics in analyzing data
2. Differentiate the descriptive versus inferential nature of statistics
3. Feel comfortable in taking a set of data and understanding how it might be described and analyzed using various statistical techniques
4. Gain an appreciation of the use of statistics in the research process
5. Have the ability to critical look at statistical analysis and objectively assess the validity of the analysis

College of Agriculture and Natural Resources
COURSE WEB PAGE: The course is now being taught on WebCT. This means that you will be able to get your information from the WebCT site, including seeing your grades. Please note: many of the handouts and notes are in Adobe pdf formats (you must use the free Adobe Reader).

BASIC COURSE STRUCTURE

Here’s the bottom line:

1. **Watch the Lectures on the main page** (there are voiced-over Power Points viewed in your internet browser. (You will have to enable java script to see them).

2. **Review the Module Content**

3. **Review the relevant book chapters**

4. **Work on the Exercises**

5. **Take the Quizzes**

6. **Take the exams**

If you follow these steps you will do ok on the course! Now read what is below for more details!

STAT 200 On-Line has evolved in three important ways over time, but parts of all three versions remain in the present course. Initially, the course began with a video-tape of class lectures. However, any tape quickly becomes dated, so I was encouraged to develop learning modules in 2003. The 15 Learning Modules are part of this change and remain to this day. The Modules are like a condensed text book for the course. However, students kept telling me they want a lecture, so we re-taped the class in 2004. I then incorporated the lectures with the modules and students received DVDs of the lectures as part of the class. At this point I encouraged the students to watch the lectures, but also review the modules.

As these lectures became dated, I have shifted to a new lecture format - Voiced Over Power Points. These include Power Points of the lecture with my voice talking over top of the course. These can be viewed on-line over and over again. They are actually converted Power Points to java script so they can be seen, paused, and re-visited on-line. Each lecture is 30 minutes or less. Handouts of the Power Points can be downloaded and printed from the Course Menu (of the left hand side). These lectures are now on the Home page, next to the appropriate Modules. The old lectures can still be found on the course web page, but DVDs of these lectures are no longer available.

Here is what I suggest you do for this course.

1. **Watch the voiced over Power Points** - these are the newest lectures and focus on what you will be tested on.

2. **Review the Modules to help cement the material.** Also review the book chapters to gain another perspective.

3. **Complete the exercises and quizzes** to review the materials and see if you are getting it

4. **Take the appropriate quizzes** - you can take the quizzes up to two times

The following is a listing of the modules and the sequence of quizzes and exams.

**Part I  Describing Data**

- **Module 1:** Statistics and Data
- **Module 2:** Exploring Data with Graphs
- **Module 3:** Measures of Central Tendency
Module 4: Measures of Variability
Quiz 1

Part II Probability
Module 5: Introduction to Probability
Module 6: Probability and Tables
Quiz 2
Module 7: Discrete Probability and the Binomial Distribution
Module 8: Continuous Random Variables and the Normal Distribution
Quiz 3

EXAM I

Part III Inference
Module 9: Sampling Distribution: Means and Proportions as Random Variables,
Module 10: Confidence Intervals of a Mean or Proportion
Module 11: Hypothesis Tests of a Single Mean or Proportion
Quiz 4

Part IV Two Variable Analysis
Module 12: Difference of Two Means Test
Module 13: Difference of Two Proportions
Quiz 5
Module 14: Correlation
Module 15: Introduction to Regression
Quiz 6

EXAM II

GRADING POLICY: The course grade will be based on 2 exams, 6 quizzes (on-line with immediate feedback), and 8 exercises. The two exams will be worth 32 points each. The exams will be spaced evenly through out the semester and focus on two sections of the course. Students will be notified as to the exact time and location of the exams (see below). I will give you advanced notice if the date of an exam will change.

The exams will be a combination of True and False, multiple choice, definitions, and problem solving. The exams will not be cumulative. I will not require gross memorization of formulas for the exams, and will allow a single sheet of notes (both front and back) for each exam. You do not need to turn in the sheet of notes with the exam. I will not be returning the exams to you - past experience has shown that it is too difficult to do that is the time allotted for an on-line course. I will try to give you some feedback if there are real problems in your performance.

The quizzes use the automatic WebCT function for the quizzes. WebCT will grade the quizzes automatically and you will get instant feedback. The strategy will be to have thee quizzes before each exam. This will give you practice for the exam. Each quiz will be worth 4 points each toward the final grade. You can take each quiz twice, and keep the highest score. You
can have all your resources with you while taking the quiz - the book, notes, and handouts - and roughly one hour to complete 12 questions. I expect most people to do well on the quizzes.

I do not have traditional homework as part of this course, but I will use eight exercises to force you to try to work through problems. **The exercises are required and are not extra-credit.**

The exercises are available on WebCT in Microsoft Word or PDF format. All you need to do is complete the exercises and submit them online BEFORE the due date. If you complete the exercise you will receive 1.5 points toward your final grade for each exercise completed. Students will receive full credit for each exercise, regardless of whether their answers are correct as long as he/she made an honest effort to complete the problems. I will post the answers to each exercise after the due dates listed below on the web page. The exercises will count for 12 points total (1.5 points each) toward your final grade. Don’t make the mistake of neglecting the exercises - if you don’t complete the exercise you lose the points.

Finally, I will give you one free point toward your grade (out of 100) if you e-mail me in the beginning of class. Please e-mail me as soon as possible and tell me why you are taking the course and any other information you wish to share. I will use the WebCT e-mail system. **If you prefer to use your own e-mail system please use the forwarding option in WebCT.**

Your final grade will be based on the following:

- **2 exams @ 32 points each**  
  64 pts
- **6 quizzes @ 4 points each**  
  24 pts
- **8 exercises @ 1.5 points each**  
  12 pts
- **1 free point if you e-mail me**  
  1 pt

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**This is how I convert the final score into a letter grade:**

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<thead>
<tr>
<th>Grade</th>
<th>Points</th>
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<tbody>
<tr>
<td>A</td>
<td>93 to 101</td>
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<tr>
<td>A-</td>
<td>90 to 92.9</td>
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<tr>
<td>B+</td>
<td>87 to 89.9</td>
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<td>B</td>
<td>83 to 86.9</td>
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<tr>
<td>B-</td>
<td>80 to 82.9</td>
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<tr>
<td>C+</td>
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<td>C</td>
<td>73 to 76.9</td>
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<tr>
<td>C-</td>
<td>70 to 72.9</td>
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<td>D+</td>
<td>67 to 69.9</td>
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<tr>
<td>D</td>
<td>63 to 66.9</td>
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<tr>
<td>D-</td>
<td>60 to 62.9</td>
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<tr>
<td>F</td>
<td>Below 60</td>
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</table>

**COURSE SCHEDULE AND TIME LINE:** The time schedule for the course, including due dates of exercises and quizzes are listed in the course schedule on the last page. While I cannot give you an exact time of when you should complete a module, use the quizzes and exercises to gauge where you should be in the course.

**All exams for this course is administered by UD On-Line (302/831-2741).**

[http://www.continuingstudies.udel.edu/udonline/faculty/](http://www.continuingstudies.udel.edu/udonline/faculty/)  
You should have received information from their office when you registered for this course.
Newark students will take exams at the UD Online Resource Center, located at 850 Library Avenue, Suite 200. **A computer-based exam will be administered only at this location.** You may take exams during the week listed on the course syllabus on a walk-in basis during the following testing hours: Monday 11:00-5:00 Tuesday 10:00-5:00 Wednesday 10:00-8:00 Thursday 10:00-8:00 Friday 10:00-5:00 You will have the entire week to take your exam. Please don’t wait until the end of the exam week in order to lessen the possibility of long wait times.

If you do not take your exam as scheduled, it is your responsibility to contact your instructor for permission to reschedule the exam. No exam will be rescheduled by the UD Online office without approval from the instructor e-mailed to: udonline-exams@udel.edu.

The examination process for students not testing in Newark (i.e., students testing in Wilmington, Dover, Georgetown, worksites, community colleges, with individual proctors or high schools) remains the same. You will be given instructions as to how and when to take your exam. These will be paper exams.

**SUPPLEMENTAL MATERIAL:** I recommend that you have access to the following:

- A calculator which has multiple memory registers and the ability to take logs. This calculator need not include statistical functions or graphing and may be as cheap as $15 (you don’t need an expensive calculator). You will need the calculator for exams.

- Access to Microsoft Excel or another spreadsheet program. I do not require Excel or another spreadsheet, but I will demonstrate its use for statistics in class. If you do not have Excel, there is a free reader than you can download to at least see the Excel files and how they might be used.

**ABOUT THE BOOK:** I chose this book because I like the mix of traditional statistics with a healthy scepticism of how statistics are used. (Or abused) in research today. I think you will find the book to be friendly and easy reading. However, the book does not follow the order or flow I am used to using. My notes on the web will set the tone for the course, but I will reference the chapters and sections of the book that you should read. My strong recommendation is to read the book to help prepare you for exercises and exams. **Note, the book is comprised of selected chapters of the original book to keep costs down.**

**Required Text:** Mind on Statistics, 3rd Edition
Jessica M. Utts - University of California, Davis
Robert F. Heckard - Pennsylvania State University
There is a special version for $68.99 at the following site:
http://udelstats.tlcservicesites.com

**Here are the required Chapters**

Chapter 1  Statistics Success Stories and Cautionary Tales

Chapter 2  Turning Data Into Information
Types of variables
Graphing
Measures of Central Tendency
Measures of Variability
Features of Bell-shaped Distributions

Chapter 5 Relationships Between Quantitative Variables
Correlation
Regression

Chapter 7 Probability
Basics of Probability

Chapter 8 Random Variables
Discrete random variables
Binomial random variables
Continuous random variables and the normal distribution

Chapter 9 Understanding Sampling Distributions: Statistics and Random Variables

Chapter 10 Estimating Proportions with Confidence
Single Proportion Confidence Interval
Difference between Two Proportions Confidence Interval

Chapter 11 Estimating Means with Confidence
Single mean Confidence Interval
Difference between Two Means Confidence Interval

Chapter 12 Testing Hypotheses About Proportions
Single Proportion Hypothesis Test
Difference Between Two Proportions Hypothesis Test

Chapter 13 Testing Hypotheses About Means
Single Mean Hypothesis Test
Difference Between Two Means Hypothesis Test

PREREQUISITE SKILLS: Statistics necessarily require the use of math and the computer. The level of math will not be beyond basic algebra. If you have any concerns about your math skills I suggest you get a review book much like is sold for the SAT test to help you review basic algebra. I will use class time to show you basic approaches to analysis on Excel. If you feel weak in the use of a spreadsheet, there are tutorials and short courses available to you. A spreadsheet is one of the more flexible computer programs for academic, business, and personal use and it is wise to feel proficient in its use.

OTHER POLICIES:
• The modular notes will be important in the course. I will cover other ideas and concepts than what is found in the book. I view the book as a supplement to the course and a source of additional problems and examples.
• I allow a single sheet of paper, printed on both sides, for each of the exams. I will include any and all statistical tables as part of the exam.
• I expect all students to do their own work. Let’s all follow the rules as outlined in the student handbook (http://www.udel.edu/stuhb/)
• If you have a certifiable disability that may affect your class performance, please inform me privately so that appropriate arrangements can be made.

**ONE FINAL NOTE.** Statistics often scare students, particularly if they don’t feel confident in their math skills. I personally feel it doesn’t have to be that way as long as you commit to working at it. I will provide plenty of in-class examples to help take the mystery out of formulas and such. However, you will have to take good notes, do the assignments, and read the text. I don’t require attendance, but the class lectures will be an important part of the course. I’m committed to working with you to help you learn the material. If you feel in trouble, by all means contact me by phone or by e-mail or come and see me if you are close by to campus.
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<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Details</th>
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<tbody>
<tr>
<td>Feb. 11</td>
<td>Semester Begins</td>
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<tr>
<td></td>
<td>Module 1: Statistics and Data</td>
<td>Lectures 1, 2 and 3</td>
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<td></td>
<td>Module 2: Graphing with Data</td>
<td>Lectures 4 and 5</td>
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<td>Module 3: Measures of Central Tendency</td>
<td>Lectures 6 and 7</td>
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<td>Feb. 18</td>
<td>Exercise 1 Due</td>
<td>Answers posted on Feb. 19</td>
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<td>Module 4: Measures of Variability</td>
<td>Lectures 8, 9, and 10</td>
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<td>Module 5: Introduction to Probability</td>
<td>Lectures 11, 12, and 13</td>
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<td>Module 6: Probability and Tables</td>
<td>Lectures 14 and 15</td>
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<td>March 13</td>
<td>Quiz 2: Modules 5 and 6</td>
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<td>Module 7: Discrete Probability and Binomial</td>
<td>Lectures 16 and 17</td>
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<td>Module 8: Continuous Random Variables/Normal</td>
<td>Lectures 18 and 19</td>
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<td>March 17</td>
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<td>March 24 to 28</td>
<td>EXAM 1 arranged during the week of March 20</td>
<td>Covers Modules 1 through 8 Lectures 1 to 19</td>
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<td>Module 9: Sampling Distribution of the Mean</td>
<td>Lectures 20 and 21</td>
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<td>Module 10: Confidence Intervals for Mean or</td>
<td>Lectures 22, 23, and 24</td>
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<td>April 14</td>
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<td>Module 11: Hypothesis Test of Mean or Proportion</td>
<td>Lectures 25, 26, and 27</td>
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<td>Module 12: Difference of Two Means</td>
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<td>Module 13: Difference of Two Proportions</td>
<td>Lecture 29 and 30</td>
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<td>Module 14: Correlation</td>
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<td>Module 15: Introduction to Regression</td>
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