COLLEGE OF SOUTHERN MARYLAND
MTH 2300 - INTRODUCTION TO STATISTICS
FALL 2009 - 3 CREDITS

INSTRUCTOR: Fred Russell
Office: ST 181. I am on campus Monday through Thursday only.
Phone: (301) 934-7807. Phone mail is on this line.
E-Mail: fredr@csmd.edu Allow at least 24 hours for me to respond.
Office Hours: Mon & Wed: 2:30 – 3:00 and 4:00 – 5:30 in ST 181
Tue & Thu: 1:00 – 1:30

CLASS TIMES: Sec. 75457 meets Mondays and Wednesdays from 5:45 – 7:05
Sec. 75458 meets Mondays and Wednesdays from 11:30 – 12:50

PROHIBITED: Do not bring food, beverages, cell phones or pagers to class.

CLOSING INFO: Call the Weather Hotline at 1-800-650-4023 for official emergency closing information.

MINITAB Software and User Manual (required)

CALCULATOR: A calculator capable of performing statistical functions is required. The TI-83, TI-83 Plus, and TI-84 are the calculators that your instructor will use in class.

PREREQUISITE: MTH 1080, MTH 1100, or the math placement test.

COURSE DESCRIPTION
In this introductory (non-calculus) course, students learn about data presentation and analysis, measures of central tendency and dispersion, probability rules, sampling distributions, confidence intervals, correlation and regression, and hypothesis testing using the z, t and chi-square test statistics. Examples are selected from business and the social and natural sciences. MINITAB statistical software is used throughout the course.

TIME REQUIREMENT AND EXPECTATIONS
In all college math courses students should expect to spend roughly 6 to 9 hours per week outside class on reading, study, and problem solving. Since most of the learning takes place outside class, this block of study time is an essential part of the course. There is NO SUBSTITUTE for adequate study time before and after every class.

It is essential that you come to EVERY class and be ON TIME. Each day we will introduce at least one new topic that will appear on an exam. It is very, very difficult to catch up if you fall behind.

It is essential that you read the textbook and work the study problems. Pay careful attention to the worked out example problems in the text. Those problems are important, and they are worth careful study.

It is essential that you stay current in your reading, studying, and problem solving. This is a university-level course which moves very fast and which requires your full attention every day. The material is new and difficult. To learn mathematics requires practice, patience, and repetition. Good time management and study skills are essential. There are no shortcuts. But it does help to find a study partner.
GRADES
Your course grade will be based on the number of points that you earn out of a possible 500. There will be:

4 Unit Exams 100 points each (400 points total)
4 MINITAB Assignments (100 points total)
Average your highest 3 scores

Course grades will be assigned as follows:

<table>
<thead>
<tr>
<th>Letter</th>
<th>Points Earned</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>450 – 500</td>
<td>90</td>
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<tr>
<td>B</td>
<td>400 – 449</td>
<td>80</td>
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<tr>
<td>C</td>
<td>325 – 399</td>
<td>65</td>
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<tr>
<td>D</td>
<td>300 – 324</td>
<td>60</td>
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<tr>
<td>F</td>
<td>0 – 299</td>
<td>less than 60</td>
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EXAMS
Exams will be given only in class and only on the following dates:

Exam 1 (Chap. 1, 2, 3, 4) Wed Oct 7
Exam 2 (Chap. 5 & 6) Mon Nov 2
Exam 3 (Chap. 7 & 8) Wed Dec 2
Exam 4 (Chap. 10 and 11) Mon Dec 21

We will make exceptions for those students covered by the Americans with Disabilities Act. (See “Disabilities and Special Needs” below.) We will follow the guidelines specified on your Accommodation Plan.

Exams will be based on the assigned readings and problems from the text, on the material covered in class, and on the “chapter problem” handouts. Exams may contain "multiple choice" and "free response" questions. Be sure to bring pencils (no ink), an eraser, and your calculator.

Exams will be closed book. However, you may bring one 3 by 5 inch index card (both sides) of your own handwritten notes to use during the exams. You may not use photocopied or commercially printed material or any notes prepared by another person. Statistical tables will be provided for your use during exams.

DISABILITIES AND SPECIAL NEEDS
Students with disabilities or special needs should contact the Learning Assistance Center before classes begin to formulate an Accommodation Plan. This important document describes what is medically necessary in order for you to take this course. Until you present your Accommodation Plan your instructor cannot and will not honor your requests for extra time, exams in the Testing Center, special seating, large print, etc...

MAKE -UP EXAMS
Make up exams will be available from December 16 - 19, 2009. Make-ups will be closed book, multiple-choice, exams taken without the benefit of a note card. Bring pencils, an eraser, and your calculator. Statistical tables will be provided. Because of tight deadlines at the end of the semester, make-up exams must be completed by the close of business on December 19, 2009.
MINITAB ASSIGNMENTS
Four assignments requiring MINITAB Statistical Software will be collected and graded. Due dates are given on the attached daily schedule. You may do the MINITAB assignments in the "open" computer labs on the CSM campus, or on your own home computer using the software that came with the textbook.

Late assignments will not be accepted under any circumstances. Even if you miss class your assignment must be submitted on time.

If you miss class you may submit your assignment by US mail as long as it is postmarked on or before the due date. Send assignments to: Fred Russell / P.O. Box 1921 / La Plata, MD 20646-1921

STUDY PROBLEMS
The best way to learn statistics is to work many problems. A list of study problems is referenced on the attached daily schedule. These problems will help you to understand the main points of the chapter, and you are strongly urged to work all of them. Since the answers to all odd numbered problems are given in the back of the book, these problems will not be collected or graded.

Five problem sets will be distributed in class. Think of them as “Sample Exams”. Solution sheets will be available on “Review Day” before exams. Working and understanding these problems is excellent preparation for an exam.

AUDIT & WITHDRAWAL
The deadline for withdrawing from a course or for switching between "credit" and "audit" status is Friday, November 13, 2009. Students are responsible for submitting the necessary paperwork to the Registrar’s Office.

Audit and withdrawal are not the same. Auditing students are still enrolled in the course, but will not receive academic credit. They must continue to attend class at least once per week and submit all the required homework assignments. Your instructor will not grant your petition to change from “credit” to “audit” status unless you have attended at least 50% of the classes throughout the semester. The grade for a successful audit is AU. The grade for an unsuccessful audit is WD.

After withdrawing, a student is no longer enrolled in the course and has no further obligations. The grade for a withdrawal is WD. The grade for students who abandon the course without a withdrawal is F.

HONESTY
The one time when students are not allowed to work together or to consult with each other is during exams. Provisions of the Student Code of Conduct, found in the Student Handbook, will be followed. Persons who cheat on exams may receive a zero grade for the exam. In addition, any evidence of cheating will be forwarded to the Director of Student Affairs and the College Judicial Committee for review and possible disciplinary sanctions.

UNAUTHORIZED PERSONS
Unauthorized persons (children, friends, family members, and people who are not registered for this course) are not allowed in the classroom. Details of this college policy can be found in the Student Handbook.

GENERAL EDUCATION OBJECTIVES
MTH 2300 has been designated a "General Education" course. The general education objectives for mathematics courses are found in the college catalog.
OPTIONAL EXTRA CREDIT: CSM MATH TEAM
The CSM Math Team meets once per semester and competes with other regional colleges by taking tests and comparing results. If you choose to participate, you will receive an “extra credit” bonus of five points, plus half of the total points earned on the competitive exam, to add to one of your exam scores. To sign up, contact the La Plata Math Team coordinator, Donna Sperry, at her e-mail address, Donnas@csmd.edu.

OPTIONAL EXTRA CREDIT: PULSE OF SOUTHERN MARYLAND
Once per semester CSM conducts a telephone survey. If you choose to participate, you will receive an “extra credit” bonus of ten points. The survey is typically run on a week night, from roughly 6:00 – 9:00, using the phone bank on the CSM campus.

OBJECTIVES OF THE COURSE
After completing this course, you should be able to present and analyze statistical data using:

Descriptive Statistics: You should know:
- how to compute and interpret the 5-number summary
- how to construct data tables and histograms
- how to find the mean, median, mode and standard deviation of ungrouped data
- how to find the mean and standard deviation of grouped data
- how to compute standardized z-scores

Probability: You should know:
- how to compute probabilities for single, compound, and complementary events
- how to set up probability distributions and find the mean and standard deviation of the distribution
- when to use the binomial distribution and how to calculate binomial probabilities

Normal Distribution: You should know:
- how to compute z-scores and how to use the normal distribution table
- the implications of the Central Limit Theorem
- how to compute confidence intervals for means and proportions
- when and how to use the z and t statistics in a confidence interval
- how to determine sample size for means and proportions

Hypothesis Testing: You should know:
- how to test the three types of claims about means and proportions of large and small samples
- how to set up the null and alternative hypotheses
- when to use one or two tailed tests
- how to find and interpret p-values

Regression and Goodness of Fit: You should know:
- how to find the equation of the least squares regression line from raw data
- how to find the correlation coefficient and test for significance
- how to find and interpret the coefficient of determination
- how to set up contingency tables and test for goodness of fit
MATH 2300 - INTRODUCTION TO STATISTICS
DAILY SCHEDULE & PROBLEM LIST
FALL 2009

Date       Sections                                                                 Problems

Sep 9 (W)  READ Sections 1.1 through 1.4 lightly for an overview of statistics.
          READ Sections 2.1 through 2.4 thoroughly before next class.
          Enter the “Airliner Ages” and “Part Time Workers” data sets into your calculator
          before next class.  Bring your calculator to class.
          2.1  Overview
          2.2  Frequency Distributions  Page 48: 3, 5, 9, 1, 3, 15(*), 22
          2.3  Histograms          Page 53: 1, 3, 5, 6, 7, 8, 13
          2.4  Statistical Graphics

Sep 14 (M)
          READ Sections 3.1 through 3.3 in the text before class.
          Bring your calculator (with the two data sets entered) to class.
          3.1  Overview
          3.2  Measures of Center  Page 86: 9, 11, 17
          3.3  Measures of Variation  Page 104: 3, 9, 11, 17, 25, 27, 33

As we cover the material, work through the “Chapters 2, 3, & 4 Problems”
handout.  Think of this as a practice exam.  These problems will not be graded.

Sep 16 (W)  READ Section 3.4 and 3.5 in the text before class.
          3.4  Measures of Relative Standing  Page 116: 1 – 13 odd
          3.5  Exploratory Data Analysis  Page 126: 1, 3, 5, 14
          Page 131: Review Exercises 1 - 8

Sep 21 (M)  READ Sections 4.1 through 4.3 and Section 4.5 in the text before class.
          4.1  Overview
          4.2  Probability Fundamentals  Page 146: 7, 11, 13, 19, 21
          4.3  Addition Rule  Page 156: 7 – 20
          4.5  Conditional Probability  Page 173: 21 - 24

Sep 23 (W)  MINITAB Lab.  We will meet in LR 118 today.  Bring a diskette or other storage device.
If the college is closed we will reschedule this lab for later in the semester.

MINITAB Assignment 1, “Descriptive Statistics”, will be available today.

Sep 28 (M)  READ Sections 4.4 and 4.5 in the text before class.
          4.4  Multiplication Rule  Page 165: 9, 11, 15, 17 – 20
          4.5  Complements  Page 171: 1 – 7 odd, 11, 17, 19
<table>
<thead>
<tr>
<th>Meeting</th>
<th>Sections</th>
<th>Problems</th>
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<tr>
<td>Sep 30 (W)</td>
<td><strong>READ Sections 5.1 and 5.2 in the text before class.</strong></td>
<td><strong>Page 204: 7, 9, 11, 13, 23</strong></td>
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<td></td>
<td>5.1 Overview</td>
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<td>5.2 Random Variables</td>
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<td>As we cover the material, work through the <strong>“Chapters 5 Problems”</strong> handout.</td>
<td>Think of this as a <strong>practice exam</strong>. These problems will <strong>not</strong> be graded.</td>
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<td><strong>MINITAB Assignment 1</strong> is due at the beginning of class today.</td>
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<td>As always, late assignments will <strong>NOT</strong> be accepted.</td>
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<td>Oct 5 (M)</td>
<td><strong>Problem solving day.</strong> No new material. This is a day for you to ask questions.</td>
<td><strong>“Chapters 2, 3, &amp; 4 Problems”</strong> answer key will be available today.</td>
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<td>Oct 7 (W)</td>
<td><strong>EXAM 1</strong> -- Chapters 1, 2, 3, and 4.</td>
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<td><strong>MINITAB Assignment 2, “Central Limit Theorem”,</strong> will be passed out in class today.</td>
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<td>Oct 12 (M)</td>
<td><strong>READ Section 4.3 in the text before class.</strong></td>
<td><strong>Page 214: 1 – 35 odd</strong></td>
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<td>5.3 Binomial Probability Distributions</td>
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<td>Oct 14 (W)</td>
<td><strong>READ Sections 5.4, 6.1, and 6.2 in the text before class.</strong></td>
<td><strong>Page 221: 1 - 19odd</strong></td>
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<td>5.4 Binomial Mean &amp; Variance</td>
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<td>6.1 Overview</td>
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<td>6.2 Uniform and Standard Normal</td>
<td><strong>Page 245: 1 – 27odd, 37, 39</strong></td>
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<td>Oct 19 (M)</td>
<td><strong>READ Sections 6.2 and 6.3 AT LEAST TWICE before class.</strong></td>
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<td><strong>Everything we do for the rest of the course will depend on the normal distribution.</strong></td>
<td><em>Be sure to attend today’s class. These topics are very important.</em></td>
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<td>6.2 Standard Normal Distribution</td>
<td><strong>Page 254: 5 – 23 odd</strong></td>
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<td>6.3 Applications of the Normal Distribution</td>
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<td>As we cover the material, work through the <strong>“Chapters 6 Problems”</strong> handout.</td>
<td>Think of this as a <strong>practice exam</strong>. These problems will <strong>not</strong> be graded.</td>
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<td>Oct 21 (W)</td>
<td><strong>READ Section 6.4 &amp; 6.5 in the text before class.</strong></td>
<td><strong>Page 266: 7, 9, 11</strong></td>
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<td>6.4 Sampling Distributions and Estimators</td>
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<td>6.5 Central Limit Theorem</td>
<td><strong>Page 275: 1 – 19 odd</strong></td>
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<td>Oct 26 (M)</td>
<td><strong>READ Sections 7.1 and 7.3 in the text before class.</strong></td>
<td><strong>Page 326: 9 – 29 odd, 33 – 37 odd</strong></td>
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<td>7.1 Overview</td>
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<td>7.3 Estimating a Population Mean when the population variance is known</td>
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Oct 28 (W)  MINITAB Assignment 2 is due at the beginning of class today. As always, late assignments will NOT be accepted.

Problem solving day. No new material. This is a day for you to ask questions. “Chapter 5 & 6 Problems” answer keys will be available today.

Nov 2 (M)  EXAM 2 -- Chapters 5 & 6
MINITAB Assignment 3, “Confidence Intervals”, will be passed out in class today.

Nov 4 (W)  READ Section 7.4 in the text before class.
7.4   Estimating a Population Mean when the population variance is unknown  Page 339: 5 – 27 odd

Nov 9 (M)  READ Section 7.2 in the text before class.
7.2   Estimating a Population Proportion  Page 312: 5 – 27 odd, 37 – 43 odd

As we cover the material, work through the “Chapters 7 & 8 Problems” handout. Think of this as a practice exam. These problems will not be graded.

Nov 11 (W)  READ Sections 8.1 and 8.2 in the text before class.
8.1   Overview
(Ignore “Power of a Test”.)

Nov 16 (M)  READ Section 8.4 in the text before class.
8.4   Testing a Claim about a Mean when the population variance is known  Page 403: 5 – 17 odd

MINITAB Assignment 3 is due at the beginning of class today. As always, late assignments will NOT be accepted.

MINITAB Assignment 4, “Hypothesis Testing”, will be passed out in class today.

Nov 18 (W)  READ Section 8.5 in the text before class.
8.5   Testing a Claim about a Mean when the population variance is unknown  Page 411: 1 – 15 odd, 17, 19, 25, 27
<table>
<thead>
<tr>
<th>Meeting</th>
<th>Sections</th>
<th>Problems</th>
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<tr>
<td>Nov 23 (M)</td>
<td><strong>READ Sections 10.1 through 10.4 in the text before class.</strong></td>
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<td>10.1 Overview</td>
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<td>10.2 Correlation</td>
<td>Page 500: 13, 17, 23, 25</td>
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<td>10.3 Linear Regression</td>
<td>Page 521: 13, 17, 23, 25</td>
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<td>10.4 Explained and Unexplained Variation</td>
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<td><strong>Minitab Assignment 4 is due at the beginning of class today.</strong></td>
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<td>As always, late assignments will NOT be accepted.</td>
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<td>Nov 30 (M)</td>
<td><strong>Problem solving day.</strong> No new material. This is a day for you to ask questions.**</td>
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<td><strong>“Chapter 7 &amp; 8 Problems” answer key will be available today.</strong></td>
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<td>Dec 2 (W)</td>
<td><strong>Exam 3 -- Chapters 7 &amp; 8</strong></td>
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<td>Dec 7 (M)</td>
<td><strong>READ Sections 10.1 through 10.4 in the text before class.</strong></td>
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<td>Finish Linear Regression and Correlation.</td>
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<td></td>
<td>10.1 Overview</td>
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<tr>
<td></td>
<td>10.2 Correlation</td>
<td>Page 500: 13, 17, 23, 25</td>
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<td>10.3 Linear Regression</td>
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<td>10.4 Explained and Unexplained Variation</td>
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<td>As we cover the material, work through the “<strong>Chapters 10 &amp; 11 Problems</strong> handout.**</td>
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<td>Think of this as a <strong>practice exam</strong>. These problems will <strong>not</strong> be graded.</td>
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<td>Dec 9 (W)</td>
<td><strong>READ Sections 11.1 and 11.2 in the text before class.</strong></td>
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<td>11.1 Overview</td>
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<td>11.2 Multinomial Experiments: Goodness of Fit</td>
<td>Page 562: 1-4, 7, 9, 11</td>
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<td>Dec 14 (M)</td>
<td><strong>READ Section 11.3 in the text before class.</strong></td>
<td>Page 578: 7, 9, 19</td>
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<td>Dec 16 (W)</td>
<td><strong>Problem solving day.</strong> No new material. This is a day for you to ask questions.**</td>
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<td><strong>“Chapter 10 &amp; 11 Problems” answer key will be available today.</strong></td>
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<tr>
<td>Dec 21 (W)</td>
<td><strong>Exam 4 -- Chapters 10 &amp; 11</strong></td>
<td>The course is now officially over.</td>
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