Syllabus 11-17-08
(subject to revision)

STT 351 - 4 MW 5:00 - 6:20 C314 WH Final Exam Tu Dec 9 5:45-7:45 C314 WH
STT 351 - 5 MW 3:00 - 4:20 113 EBH Final Exam W Dec 10 3:00-5:00 113 EBH

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Office Hours M 1:45-2:30, Tu 1:45-2:30, W 1:45-2:30 in A428 WH.
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Textbook : Probability and Statistics for Engineering and the Sciences by Jay L. Devore, Seventh Ed. 2008, Thompson Publ. Class website www.stt.msu.edu/~lepage.

Calendar: Chapters are shown in superscripts for each day (topics to be announced). Exam days are shown as bold.

August		September		October		November		December		
M	W	M	W	M	W	M	W	M	Tu	W
25^{1}	27^{1}	LD	3^{2}		1^{4}	3^{12}	5^{12}	1^{rev}		3^{rev}
		8^{2}	10^{3}	6^{5}	8^{5}	10^{13}	12^{13}		$\mathbf{9}^{351-4}$	$\mathbf{10}^{351-5}$
		15^{3}	17^{rev}	13^{6}	15^{6}	17^{8}	19^{8}		(5:45)	(3:00)
		22^{rev}	**24**	20^{7}	22^{7}	24^{8}	**26**			
		29^{4}		**27**	29^{12}					

Grading Scale: Each exam, including the final exam, is given a grade on 4.0 scale. Likewise, graded homework is given an aggregate grade on 4.0 scale. It is possible to earn greater than 4.0 on some activities. Grades are combined into a course grade, the larger of

course grade A = 0.5 (three exam average grade) + 0.25 (hw grade) + 0.25 (final exam grade)
course grade B = 0.25 (avg of exam 1 & 2 grades) + 0.2 (exam 3 grade) + 0.25 (hw grade) + 0.3 (final exam)

Grade Reporting: Grades reported to the registrar will be determined from your overall course grade

course grade (above)	reported grade
0.0 to < 0.9	0.0
0.9 to < 1.4	1.0
1.4 to < 1.9	1.5
1.9 to < 2.4	2.0
2.4 to < 2.9	2.5
2.9 to < 3.4	3.0
3.4 to < 3.9	3.5
3.9 or above	4.0

Scales given above may be relaxed at the discretion of the instructor.

Important Dates for Fall Semester, 2008:

August 25	First Day of Classes
September 1	Labor Day (University Closed
September 18	End of 100% Refund
October 14	Middle of Semester
November 27 - 28	Thanksgiving Holiday (University Closed)
December 5	Last Day of Classes

December 8 - 12 Final Exams

Chapter 1. Read boxplot, dotplot, stem and leaf plot on your own.

a. I'll cover histograms in class. Histograms represent data concentrations by area boxes (more area = more data). Try exercises 13b, 23.

b. Fig. 1.11 shows some data sets "smoothed out" into a kind of continuous histograms. Here is how they are made.

List of numbers (data) x1, ... xn.

Density estimate at bandwidth σ is the plot of f(x) versus x with

$$f(x) = \frac{1}{n}\sum_{i=1}^{n} \frac{1}{\sqrt{2\pi}}\,\frac{1}{\sigma} e^{-\frac{(x-xi)^2}{2\sigma^2}}.$$

I will go over it in class and describe software you can use to plot such densities for different choices of bandwidth.

Variants of the above formula are used in which one has variable bandwidth, perhaps coupled with functions other than the exponent of the square seen above. We will not cover them.

c. Mean (from raw data or from grouped data). Median, Modes, percentiles, proportions. Try 35, 39.

d. Sample variance s^2, sample standard deviation s. Response of s to scale change (multiplication of all data values by a given number) or location change (adding a given umber to all data values). Try 45, 49.

e. Margin of error (supplement to chapter 1) given by

$$\text{MOE} = 1.96\,\frac{s}{\sqrt{n}}$$

Calculate the margin of error for data of 49 and 63. Know the claim made for margin of error (to be presented in class) that, under appropriate assumptions on the data,

$$P(\text{population mean is covered by the random interval } \overline{x} \pm 1.96\,\frac{s}{\sqrt{n}}) \sim 0.95.$$

Chapter 2. Probability calculations largely turn on a few basic ideas rooted in ordinary arithmetic.

Addition Rule $P(A \cup B) + P(A \cap B) = P(A) + P(B)$

Relative counts in Example 2.24 $\frac{(2+6+1)}{11} + \frac{(2)}{11} = \frac{(2+6)}{11} + \frac{(2+1)}{11}$

Multiplication Rule $P(A \cap B) = P(A)\,P(B \mid A)$

Relative counts in Example 2.24 $\frac{(2)}{11} = \frac{(2+6)}{11}\;\frac{(2)}{(2+6)}$

Tree diagrams as in Example 2.29.

Independence of events (i.e. $P(A \cap B) = P(A)\,P(B)$, or equivalently $P(B \mid A) = P(B)$).

Try 11, 13, 17, 19, 45, 63, 65, 71, 73, 75, 91, 93,