

## SM230 Probability with Naval Applications Spring 2005 Syllabus

**Text: *Probability & Statistics for Engineers & Scientists*  
7<sup>th</sup> Edition, by Walpole, Myers, Myers, Ye**

### NOTES:

- Course description:  
*An elementary treatment of the basic concepts of probability with an emphasis on naval applications. Sample spaces, discrete and continuous random variables and standard distributions. Selected topics of naval applications of probability theory such as random search, minefields and lateral range curves. Conditional probability and Bayes' theorem.*
- The Mathematics Department course website  
<http://usna.edu/MathDept/website/local/courses.htm>  
will have the most up to date information about SM230, including: **Syllabus**, **Search & Detection Notes (SD)**, **Applied Problems (AP)**, and **Old Exams**.
- Information about setting up your TI-92 Plus or TI Voyage 200 calculator can be found following the lesson assignment table below.

Day	Text Sections	Topics	Exercises
1	1.1–1.6	<i>Intro, Measures of Locations, Variability</i>	p20: #1 & find 10% trimmed mean.
2		<i>TI Descriptive Statistics</i>	TI Stats/List Editor (see links below)
3	1.8 pp202–203	<i>Graphical Methods: stem and leaf plots, frequency histograms, boxplots</i>	p20: #2,7 & include mod box plot; #3 & a comparison mod box plot
4	2.1–2.2	<i>Sample Space, Events, Venn Diagrams</i>	p29: #5,6,9,10,17,19,20; <b>AP1.1</b>
5	2.3	<i>Elementary Counting Techniques</i>	p38: #1,2,7,8,9,10,11
6	2.3	<i>Elementary Counting Techniques</i>	p38: #6,15,17,19,27,29; <b>AP1.2</b>
7	2.4–2.5	<i>Probability: Definition and Rules</i>	p46: #3,4,5,6,8,15; <b>AP1.3</b>
8	2.6	<i>Conditional Probability</i>	p54: #1,2,3,4
9	2.7	<i>Multiplicative Rules, Independence</i>	p54: #6,8,9,12,13,17,20,22,23
10	2.8	<i>Bayes' Rule</i>	p60: #1,2,3,4; <b>AP1.5,1.6,1.7</b>
11		Applications	<b>AP1.4,1.8,1.9,1.10</b>
12	Review		
13	Test #1		
14		Search & Detection	<b>SD: #3,4</b>
15		Search & Detection	<b>SD: #5,6,7</b>
16	3.1–3.2	<i>Random Variables, Discrete</i>	p72: #2,3,4,11,12,13,24
17	3.3	<i>Continuous Random Variables</i>	p72: #6,7,9,14,18
18	4.1	<i>Expected Value</i>	p94: #5,7,8,12,15,19,21,22
19	4.2	<i>Variance, Standard Deviation</i>	p102: #1,2,3,5,7,11
20	5.1–5.3	<i>Discrete Uniform, Binomial</i>	p124: #1,3,5,7,12,16,27; <b>AP2.1</b>
21	5.4	<i>Hypergeometric</i>	p131: #2,4,5,7,20,21; <b>AP2.5</b>
22	5.6	<i>Poisson</i>	p139: #8,9,10,12,19,20; <b>AP2.14,2.15</b>
23		Applications	<b>AP2.4;2.12,2.13; SD: #8</b>
24	Review		
25	Test #2		

26	6.1–6.4	Continuous Uniform, Normal	p156: #1,2,3,4,5,21
27	6.4	Normal	p156: #9,10,13,17; <b>AP3.2–3.5</b>
28	6.6–6.7	Exponential	p174: #7,8,15; <b>AP3.8</b>
29	3.4	Bivariate Discrete Random Variables	p84: #2,3,17
30	3.4,4.1	Independence, Expected Value	p84: #13,14,20,21; p.95:#23,25
31	4.2,4.3	Correlation, Linear Combinations	p102:#13 & $\rho_{XY}$ ; p112: #1,3,4,8,14,15
32	8.1–8.2	Intro to Statistics	p200: #3,4,5,9,10,11
33	8.4–8.5	Sampling Distribution of the Mean	p215: #3,4,5,7,9
34	8.5	Differences of Means	p215: #10,13,14
35	8.7	Student <i>t</i> -Distribution	p227: #9,11,12,13,14
36		Applications	<b>AP3.6,3.9; SD: #9</b>
37	Review		
38	Test #3		
39	9.4–9.5	Confidence Interval for Mean	p245: #4,7,8,11,13,15; <b>AP4.1,4.2</b>
40	9.8	CI for Difference of Means	p255: #1,3,6,7,9; <b>AP4.5</b>
41	9.10	CI for Single Proportion	p262: #1,3,5,9,10,12
42		Applications	<b>AP4.3,4.4,4.6–4.8</b>
43	Review	Applications	<b>AP1.11,2.3,2.17,3.7; SD: #10</b>
44	Review		

**Typos/clarification:**

p10: both trimmed means have incorrect numerators:

without nitrogen:  $0.32+0.37+0.47+0.43+0.36+0.42+0.38+0.43$

with nitrogen:  $0.43+0.47+0.49+0.52+0.75+0.79+0.62+0.46$

p61: in Exercises #2 and #4 the person travels through one and only one location

p211: Example 8.7 should read "...having a mean *diameter* of 5 millimeters."

**Recommendations for getting your TI calculator ready for use in SM230****1. Download TI Guidebook:**

Voyage 200: <http://education.ti.com/us/product/tech/89ti/guide/guidesgsVoy.html>

TI-92 Plus: <http://education.ti.com/us/product/tech/92p/guide/92pguideus.html>

**2. Load TI Connect Software on PC (need TI-PC cable):**

<http://education.ti.com/us/product/accessory/connectivity/down/download.html>

**3. Download TI applications (upgrade Operating System?) to PC and load to TI:**

<http://education.ti.com/us/product/apps/latest.html>

In particular, if your TI does not already have it, load the **Statistics with List Editor** Application into your TI. The Statistics with List Editor Guidebook is at:

<http://education.ti.com/downloads/guidebooks/eng/statsle.pdf>

Skim through the first 40 pages of the Guidebook, then concentrate on the Plots Menu F2 and Calc Menu F4 for Descriptive Statistics (textbook chapter 1). For Probability Distributions (textbook chapters 5 and 6) refer to the Distr Menu F5. For Inferential Statistics (textbook chapters 8 and 9) refer to the Ints Menu F7.