Statistics 231 Syllabus
Spring 2010

Instructor:      Official Office Hours:
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Grader:      Office Hours:
Ru He  3-5 W in 1221 Snedecor
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Course Web Page:  http://www.public.iastate.edu/~vardeman/stat231/stat231vard.html

Text: Probability and Statistics for Engineering and the Sciences by Devore

Parallel Reading Material: Basic Engineering Data Collection and Analysis by Vardeman and Jobe

Course Software: We'll use the JMP® software available through the University site license. You should download it and install it on your computers now. This is menu-driven software that Vardeman will occasionally demonstrate in class. However, primary responsibility for learning to use it will rest with the individual student. (The software has extensive help files.)

Problem Session: Wednesday 12-1 in the regular classroom (unless canceled on Tuesday)

Course Requirements:
1) Three in-class hour exams,
2) One two-hour comprehensive final exam during finals week (12 PM Thursday May 6),
3) Regular homework (see below), and
4) Class attendance and note-taking (there will be material covered in class not found in the text).

Grading System: The following system will be used to determine course grades.
1) Examinations will be assigned +/- letter grades.
2) The best 4 out of 5 of the following grades will be averaged for each student:
   Exam 1, Exam 2, Exam 3, Final, Final
3) Homework performance will be taken into account in deciding how to round off the average grades from above.
   a) The averages of students in the top 20% of the class on homework will be rounded up and 1/3 of a letter grade added (provided at least 75% of homework points have been earned). For example:
   \[
   \{\text{Hour Exams C,B,B} \quad \text{Final Exam B−, (B−)}\} \rightarrow \text{Average is B− /B}
   \]
   \[
   \text{Course Grade is B+} + \left(\frac{1}{3} \text{ of a letter grade}\right) = B+
   \]
b) The averages of students not in the top 20% of the class on homework but with at least 75% of all possible homework points will be rounded up. For example:

\[
\begin{align*}
\text{Hour Exams C,B,B} \\
\text{Final Exam B-, (B-)}
\end{align*}
\rightarrow \text{Average is B-}/B
\]

Course Grade is B

c) The averages of students with 60%-75% of all homework points will be rounded down. For example:

\[
\begin{align*}
\text{Hour Exams C,B,B} \\
\text{Final Exam B-, (B-)}
\end{align*}
\rightarrow \text{Average is B-}/B
\]

Course Grade is B-

d) The averages of students with less than 60% of all homework points will be rounded down, and at the instructor's discretion, 1/3 of a letter grade may be subtracted in order to produce a course grade. For example, potentially:

\[
\begin{align*}
\text{Hour Exams C,B,B} \\
\text{Final Exam B-, (B-)}
\end{align*}
\rightarrow \text{Average is B-}/B
\]

Course Grade is (B-)-\left(\frac{1}{3} \text{ of a letter grade}\right) = C+

Words of Wisdom: This course will be a lot of work. The material of the course is absolutely essential to both education and practice in Industrial Engineering. All of IE 361, IE 413, IE 441, IE 446, IE 448, and IE 483 are heavily dependent upon the material you will meet in Stat 231. Decide to give it your best shot from the very beginning, and to keep after it even if you suffer initial setbacks. If you do so, you will find it doable and even interesting. But don't expect to do everything the night before homework is due or an exam is scheduled. Such an approach will leave you frustrated, confused and disappointed. A consistent effort throughout the course is your best strategy. You will find your instructor interested in helping you to master the material of Stat 231, but absolutely unbending in the requirement that you do so. For those of you who have had a low-level (perhaps high school) course in statistics and found it to be boring plug-and-chug garbage-level mathematics, be informed that those courses are no predictor of what we will meet in Stat 231. This course will be neither plug-and-chug nor trivial.

Academic Honesty: Your instructor and his Departments have an expectation that all students will be honest in their actions and communications. Individuals suspected of committing academic dishonesty will be directed to the Dean of Students Office as per University policy. For more information regarding Academic Misconduct see http://www.dso.iastate.edu/ja/academic/misconduct.html

Professionalism Statement: Your instructor and his Departments have an expectation that all students will behave in a professional manner during all interactions with fellow students, faculty, and staff. Treating others with respect and having constructive communications are examples of being professional. Being prompt and considerate of your classmates and instructor in your coming
and going are examples of being professional.\textsuperscript{1} Texting or surfing the Web or using electronic games or communication devices, reading newspapers, and carrying on extended extra-curricular conversations during lectures are examples of unprofessional (and unacceptable) conduct.

**Accommodation for Students with Disabilities:** Iowa State University compiles with the American with Disabilities Act and Sect 504 of the Rehabilitation Act. If you have a disability and anticipate needing accommodations in this course, please contact Vardeman before the end of the 2\textsuperscript{nd} week of the semester. Later requests for accommodations may not be honored. Anyone requesting an accommodation will need to obtain a SAAR form with recommendations for accommodations from the Disability Resources Office, located in Room 1076 of the Student Services Building.

**Approximate Schedule**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading (Devore)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 1/11</td>
<td>Introduction</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>T 1/12</td>
<td>Descriptive Statistics/Probability</td>
<td>Chapters 1/2</td>
</tr>
<tr>
<td>R 1/14</td>
<td>Probability</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>F 1/15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M 1/18</td>
<td>MLK Day - no class</td>
<td></td>
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<tr>
<td>T 1/19</td>
<td></td>
<td></td>
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<tr>
<td>R 1/21</td>
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<tr>
<td>F 1/22</td>
<td>Discrete Random Variables</td>
<td>Chapter 3</td>
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<tr>
<td>M 1/25</td>
<td></td>
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<tr>
<td>T 1/26</td>
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<td>R 1/28</td>
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<tr>
<td>F 1/29</td>
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<tr>
<td>M 2/1</td>
<td>Continuous Random Variables</td>
<td>Chapter 4</td>
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<tr>
<td>T 2/2</td>
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<tr>
<td>R 2/4</td>
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<tr>
<td>F 2/5</td>
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<tr>
<td>M 2/8</td>
<td>Joint Distributions</td>
<td>Chapter 5 (5.1, 5.2)</td>
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<tr>
<td>T 2/9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R 2/11</td>
<td>Distribution of $g(X,Y)$</td>
<td>(Section 5.3), Class Notes</td>
</tr>
<tr>
<td>F 2/12</td>
<td>Laws of Expectation and Variance</td>
<td>(Section 5.5), Class Notes</td>
</tr>
</tbody>
</table>

\textsuperscript{1} Class is scheduled for 12:10-1:00. Your instructor will do his best to start and end promptly. Please do your part too. If you must unavoidably arrive late, please get in and into a seat with as little commotion as possible. If you are (unavoidably) going to have to leave early (even a couple minutes early), it is common courtesy to let your instructor know in advance, and then try to get out a back door as unobtrusively as possible. A lecture (like a business meeting!) is not a salad bar where participants drift by as it suits them. We will practice civil/courteous/professional behavior in 231 in this matter.
M 2/15
T 2/16  Propagation of Errors  Notes (Problems 5.93, 5.94)
R 2/18  CLT  (Section 5.4)
F 2/19  CLT/Transition to Statistics  Class Notes

M 2/22  Exam I over material through 2/16
T 2/23  Interval Estimation  Chapter 7
R 2/25
F 2/26

M 3/1
T 3/2
R 3/4  Testing  Chapter 8
F 3/5

M 3/8
T 3/9
R 3/11  Two Sample Estimation and Testing  Chapter 9
F 3/12

M 3/22
T 3/23
R 3/25  Simple Linear Regression  Chapter 12
F 3/26

M 3/29  Exam II over material 2/18 through 3/23
T 3/30
R 4/1
F 4/2

M 4/5
T 4/6  Aptness of SLR Model/Remedial Measures  Sections 13.1, 13.2
R 4/8
F 4/9  Lack of Fit  Class Notes (Problem 13.14)

M 4/12  Multiple Regression  Sections 13.3 - 13.5 and Notes
T 4/13
R 4/15
F 4/16

M 4/19
T 4/20
R 4/22  One-Way ANOVA  Chapter 10
F 4/23  Exam III over Regression

M 4/26  One-Way ANOVA  Chapter 10
T 4/27
R 4/29  Analysis of Covariance  Class Notes
F 4/30  Two-Way Contingency Tables  Section 14.3