IE 323 – Statistical Methods in Industrial Engineering  
Spring Semester 2011

Class Meeting: MWF 9:05-9:55 102 Leonhard

Instructor: Mrs. E. M. Joshi  
302 Leonhard  
863-3395  
ejoshi@psu.edu

Office Hours: M 2:00 – 4:00pm  
W 10:00 - noon  
(or by appointment)

Teaching Assistant: Rajiv Balasubramaniam  
204 Leonhard  
863-8022  
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Office Hours: TBA

Required Text: Probability and Statistics for Engineers & Scientists by Walpole, Myers, Myers and Ye (Eighth Edition)

Prerequisite: IE 322

Course Outcomes:
2.3 Ability to apply statistical concepts to solve real life problems, such as hypotheses testing, design of experiments and statistical quality control methods including process capability and control charts.
4.2 Demonstrate knowledge of contemporary issues: six sigma quality principles.

Grading Policy:  
Homework 25%  
Final course grade: 90-100 A, A-  
1st Exam 20% (This is a C or better course)  
80-89 B+, B, B-  
2nd Exam 25%  
70-79 C+, C  
Final Exam 30%  
60-69 D  
Below 60 results in failing the course

Homework Assignments  
Homework assignments will be made weekly and will consist of two parts: problems from your book which are not to be turned in and additional problems handed out in class which are to be turned in. It is to your advantage to work both sets of problems. For the assignments that are turned in, answers should be written neatly, papers stapled, and all work must be shown for full credit. Assignments not meeting these specifications will not be accepted. The back of your textbook contains the answers to the odd-numbered problems in the book. The solutions to the handed-out problems will be posted on ANGEL after the assignment has been graded and handed back. Some assignments will also involve the use of the statistical software Minitab. Students are free to use Excel if they prefer.

Assignments are due at the beginning of class (9:05am) on the assigned due date. If you do not hand in your homework at this time it will be considered late. If you arrive late to class, please take a seat and you may hand in your homework at the end of the period for a loss of 5% points. Do not disrupt the class by walking up front and placing it on my desk. After 9:55am (the end of class), assignments will not be accepted. Do not slide assignments under my office door and do not leave assignments on the TA’s desk. At the end of the semester, the lowest homework grade will be dropped.

Academic Dishonesty  
Each assignment done for this class is to be an individual effort. I understand that many students like to study in groups, however, for this type of material, I expect you to work each problem on your own. Blatant copying of answers will not be tolerated. Academic dishonesty as defined in Senate policy 49-20 reads, "Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students." This Senate policy will be strictly enforced. Any persons caught with identical assignments will be penalized to the fullest extent.

ANGEL Software  
The ANGEL system will be used to post homework assignments, solutions, a class schedule (including handouts) and important dates.

Attendance  
The course is being videotaped so that it can be offered online during the summers. For now, the videotapes will be made available to you in the event that you cannot make class on a particular day. However, if I feel that this is impeding attendance, then I will disable that ability. I strongly encourage you to attend class regularly and will also take attendance periodically during the course of the semester.
Exams
The exams have been scheduled as two 75-minute evening exams to be given on:

- Exam I - Thursday, February 17th, 6:30 - 7:45pm, 112 Walker
- Exam II - Thursday, March 31st, 6:30 - 7:45pm, 112 Walker

Please arrive by 6:15pm for each exam.
The final exam information will be announced in class as soon as it becomes available. A conflict will only be given to those students who file for one by the deadline.

Exam Policy
- Exams are closed book, closed notes.
- You are allowed one formula sheet; 8-1/2 by 11 with no flaps. **Do not staple or tape 2 sheets together.**
- Copies of necessary tables will be provided. Please return these to me after the exam.
- There will be a review session, in class, on the day of the exam.
- The wearing of baseball caps is prohibited during an exam.

You are expected to notify me ahead of time of any conflicts with these dates and only if I find the conflict justifiable, will a make-up exam be given. **Anyone missing the exam without notifying me ahead of time (and/or for a reason not deemed justifiable) will not be able to make it up.**

### COURSE OUTLINE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Textbook</th>
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<tbody>
<tr>
<td>1</td>
<td>Review of Random Sampling and Sampling Distributions</td>
<td>Chap. 8 (omitting 8.3)</td>
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<tr>
<td>2</td>
<td>Review of Estimation</td>
<td>Chap. 9, 9.1 thru 9.7 (omitting 9.6)</td>
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<tr>
<td>3</td>
<td>Review of Estimation</td>
<td>Chap. 9, 9.8 thru 9.13 (omitting 9.14)</td>
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<tr>
<td>4</td>
<td>Tests of Hypotheses</td>
<td>Chap. 10, 10.1 thru 10.7</td>
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<tr>
<td>5</td>
<td>Tests of Hypotheses</td>
<td>Chap. 10, 10.8, 10.9 and O-C curves</td>
</tr>
<tr>
<td>6</td>
<td>Tests of Hypotheses Review for Exam I</td>
<td>Chap. 10, 10.13, 10.11 and 10.12</td>
</tr>
<tr>
<td>7</td>
<td>Tests of Hypotheses</td>
<td>Chap. 10, 10.14 plus K-S test</td>
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<tr>
<td>8</td>
<td>Tests of Hypotheses</td>
<td>Minitab and Chap. 10, 10.15 thru 10.17</td>
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<td>**</td>
<td><strong>SPRING BREAK</strong></td>
<td>Chap. 11, 11.1 thru 11.8</td>
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<tr>
<td>9</td>
<td>Simple Linear Regression</td>
<td>Chap. 11, 11.9 thru 11.12</td>
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<tr>
<td>10</td>
<td>Simple Linear Regression</td>
<td>Chap. 13, 13.1 thru 13.3</td>
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<tr>
<td>11</td>
<td>Design of Experiments – One Factor</td>
<td>Chap. 13, 13.6</td>
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<tr>
<td>12</td>
<td>Design of Experiments – Two Factor</td>
<td>Chap. 14, 14.1 thru 14.3</td>
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<tr>
<td>13</td>
<td>Design of Experiments – 2^k Designs</td>
<td>Chap. 15, 15.1, 15.2 and 15.4</td>
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<tr>
<td>14</td>
<td>Control Charts for Measurements</td>
<td>Chap. 17, 17.1 thru 17.4</td>
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<tr>
<td>15</td>
<td>Control Charts for Attributes</td>
<td>Chap. 17, 17.5 and 17.6</td>
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<td>Gage R &amp; R Studies and Six Sigma Concepts</td>
<td>Chap. 17, 17.5 and 17.6</td>
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