STAT 495: Applied Statistics for Industry I

Syllabus, Fall 2008

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Office Hours: MTWTh 9:00-9:50 Central Time
M 1:10-2:00 Central Time
and by appointment.

Lecture: This course will be delivered via the World Wide Web. Students will view two lectures each week. Lecture tapes will be available via WebCT.

Materials: The text *Statistical Quality Design and Control* 2nd edition by DeVor, Chang and Sutherland is the required text. Course materials will be made available to all students via WebCT. Also check the course website.

Computing: The preferred computing package is JMP. This program can be downloaded from the ISU website or a CD can be sent to you. Students may use other statistical computing packages, e.g. Minitab but there is no guarantee that the instructor can help if they run into problems using such a package.

Exams: Exam 1: by Friday, October 3
Exam 2: by Friday, November 7
Final Exam: by Friday, December 19

Assignments: Reading assignments correspond to the lecture for that day. It is recommended that you read the suggested sections in the text prior to viewing the tape. The due date for each assignment is one week after it is assigned. Corrected assignments will be returned as soon as possible. Solutions will be posted via WebCT.
Grading: Grading is based on your performance on exams and homework assignments. The breakdown of points is as follows:

- Exam 1: 100 pts
- Exam 2: 100 pts
- Final Exam: 130 pts
- Homework: 100 pts
- Project: 70 pts
- Total 500 pts

<table>
<thead>
<tr>
<th>Tape # and Material Covered</th>
<th>Assignment</th>
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<tbody>
<tr>
<td>1. Introduction</td>
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<td>2. Statistical Thinking</td>
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<tr>
<td>3. Quality Improvement</td>
<td>Sections 1.1, 1.2, 1.3</td>
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<tr>
<td>6 Sigma</td>
<td>Sections 2.1, 2.2, 2.3</td>
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<td>4. Actions Based on Data</td>
<td>Sections 3.1, 3.2</td>
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<tr>
<td>Analytic vs. Enumerative</td>
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<tr>
<td>Studies</td>
<td>Homework #1 assigned</td>
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<tr>
<td>5. Magnificent Seven: Part 1</td>
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<tr>
<td>Flow charts, cause-and-effect,</td>
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<td>Pareto charts</td>
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<td>6. Magnificent Seven: Part 2</td>
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<tr>
<td>Histograms, scatterplots,</td>
<td>Section 3.3</td>
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<tr>
<td>stratification</td>
<td>Homework #2 assigned</td>
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Week of August 25, students view tapes 1 & 2.

Week of September 1, students will view tapes 3 & 4.

5. Magnificent Seven: Part 1
   Flow charts, cause-and-effect,
   Pareto charts

6. Magnificent Seven: Part 2
   Histograms, scatterplots,
   stratification

Week of September 8, students view tapes 5 & 6, Homework #1 due.

7. The Measurement System

8. Gage R & R                   Homework #3 assigned

Week of September 15, students view tapes 7 & 8, Homework #2 due.
<table>
<thead>
<tr>
<th>Date</th>
<th>Tape # and Material Covered</th>
<th>Assignment</th>
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<tbody>
<tr>
<td>9. Statistical Control</td>
<td>Sections 5.1, 5.2, 5.3</td>
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<tr>
<td>10. Review for Exam 1</td>
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**Week of September 22, students view tapes 9 & 10, Homework #3 due.**

******** Exam 1 ********

<table>
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<tr>
<th>Assignment</th>
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<tbody>
<tr>
<td>11. Introduction to Control Charts</td>
<td>Sections 5.4, 5.5, 5.6</td>
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</table>

**Week of September 29, students take Exam 1 and view tape 11.**

12. $\bar{X}$&$R$ charts, construction Sections 6.1–6.5

13. $\bar{X}$&$R$ charts, interpretation Chapter 6.6–6.9

Homework #4 assigned

**Week of October 6, students view tapes 12 & 13.**

14. Evaluating alarm rules Rational Subgrouping Chapter 7

15. Other charts for measurement data Sections 9.1–9.3

Homework #5 assigned

**Week of October 13, students view tapes 14 & 15, Homework #4 due.**

16. Control charts for count data I Sections 13.1–13.4

17. Control charts for count data II Sections 13.5, 13.6

Homework #6 assigned

**Week of October 20, students view tapes 16 & 17, Homework #5 due.**

18. Assumptions, caveats and cautions

19. Review for Exam 2

**Week of October 27, students view tapes 18 & 19, Homework #6 due.**
**Exam 2**

20. Statistical thinking revisited  Chapter 12

Week of November 3, students take Exam 2 and view tape 20.

21. Process Capability I  Chapter 10

22. Process Capability II  Homework #7 assigned

Week of November 10, students view tapes 21 & 22.

23. Quantifying sources of variability, Nested designs

24. More on nested designs  Homework #8 assigned

Week of November 17, students view tapes 23 & 24, Homework #7 due.

Thanksgiving Break - Week of November 24

25. Enumerative studies; Definitions

26. Enumerative studies; Probability  Homework #9 assigned

Week of December 1, students view tapes 25 & 26, Homework #8 due.

27. Inference

28. Philosophy of Quality  Review for Final Exam

Week of December 8, students view tapes 27 & 28, Homework #9 due.

**Final Exam, Week of December 15**