STAT 496: Applied Statistics for Industry II
Syllabus, Spring 2007

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course web site: www.public.iastate.edu/~wrstephe/stat496.html

Office Hours: MWF 10:00–10:50 Central Time
MTW 1:10– 2:00 Central Time
and by appointment.

Lecture: This course will be delivered via the World Wide Web
Spring 2007. Students will view two lectures each week.
Lectures and lecture handouts will be available on WebCT.
The week of March 12 through 16 is Spring Break on campus.

Materials: Course handouts are available on line through WebCT. Additional
materials can be found on the course website
The text for Stat 495 by Devor, Chang and Sutherland will be used
in Stat 496. Applications of Statistics to Industrial Experimentation
by Cuthbert Daniel, Design and Analysis of Experiments, 4th Ed.
by Douglas C. Montgomery and Statistics for Experimenters
by Box, Hunter and Hunter are good reference books.

Exams: Exam 1: Week of February 19
Exam 2: Week of April 2
Final: Week of May 7

Assignments: The due date for each assignment is established when it is assigned
Usually homework will be due one week after it is assigned. A term
project will be due on May 4.

Grading: Grading is based on your performance on exams, the project and
homework assignments. The breakdown of points is as follows:

Exam 1: 100 pts
Exam 2: 100 pts
Homework: 100 pts
Project: 75 pts
Final Exam: 125 pts
Total 500 pts
<table>
<thead>
<tr>
<th>Lecture #</th>
<th>Material Covered</th>
<th>Reading/Homework Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture 1</td>
<td>Course mechanics. A case study of a designed experiment.</td>
<td></td>
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<tr>
<td>Lecture 2</td>
<td>Review of Statistical Thinking. Analytic vs. Enumerative.</td>
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**Week of January 15, students view lectures 1 & 2.**

Lecture 3 | Case study; Magnificent 7, control charts, capability. | Chapters 4-15 |
Lecture 4 | Helicopter experiment. General ideas of experimentation. | Homework #1 assigned (10 pts) |

**Week of January 22, students view lectures 3 & 4.**

Lecture 5 | Experimentation in an industrial setting. | Homework #2 assigned (10 pts) |
Lecture 6 | One factor experiments. Design, sample size, informal analysis. |                             |

**Week of January 29, students view lectures 5 & 6.**

Lecture 7 | Simple linear regression. | Homework #3 assigned (10 pts) |
Lecture 8 | Polynomial regression. |                             |

**Week of February 5, students view lectures 7 & 8.**

Lecture 9 | Experiments with more than one factor. Trade offs. |                             |
Lecture 10 | Review for Exam 1 |                             |

**Week of February 12, students view lectures 9 & 10.**
<table>
<thead>
<tr>
<th>Lecture #</th>
<th>Material Covered</th>
<th>Reading/Homework Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>**ISU: Exam 1 ******</td>
<td></td>
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<tr>
<td>Lecture 11</td>
<td>2(^2) factorial with replication: design and informal analysis.</td>
<td>Chapter 16</td>
</tr>
<tr>
<td>Lecture 12</td>
<td>2(^p) factorial with replication: formal analysis.</td>
<td>Chapter 17</td>
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<tr>
<td>Lecture 13</td>
<td>2(^p) factorial with replication: prediction, diagnostics.</td>
<td>Homework # 4 assigned (15 pts)</td>
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**Week of February 19, students take Exam 1 and view lecture 11.**

**Week of February 26, students view lectures 12 & 13.**

**Week of March 5, students view lectures 14 & 15.**

**Week of March 12, No Classes SPRING BREAK at ISU, no office hours**

**Week of March 19, students view lectures 16 & 17.**

**Week of March 26, students view lectures 18 & 19.**
<table>
<thead>
<tr>
<th>Lecture #</th>
<th>Material Covered</th>
<th>Assignment</th>
</tr>
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<tbody>
<tr>
<td>Lecture 20</td>
<td>$2^{p-q}$ experiments</td>
<td></td>
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<tr>
<td>Lecture 21</td>
<td>Response surface methodology.</td>
<td>Homework # 7 assigned (15 pts)</td>
</tr>
<tr>
<td>Lecture 22</td>
<td>More on response surfaces.</td>
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**Week of April 2, students take Exam 2 and view lecture 20.**

**Week of April 9, students view lectures 21 & 22.**

| Lecture 23 | Robust design, Taguchi          | Sections 15.4-15.6         |
| Lecture 24 | Putting it all together.        | Chapter 20                 |

**Week of April 16, students view lectures 23 & 24.**

| Lecture 25 | Analysis of lifetime data.      | Homework # 8 assigned (10 pts) |
| Lecture 26 | Analysis of censored data.      |                            |

**Week of April 23, students view lectures 25 & 26.**

| Lecture 27 | More analysis of censored data. |                            |
| Lecture 28 | Course summary, review for Final Exam |                            |

**Week of April 30, students view lectures 27 & 28. Project due by May 4.**

**Week of May 7  ***** Final Exam *******