STAT 495: Applied Statistics for Industry I  
Syllabus, Fall 2014

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email: wrstephe@iastate.edu  
course website: www.public.iastate.edu/~wrstephe/stat495.html

Office Hours:  M W F 10:00 – 10:50 am, T 1:10 to 2:00 pm Central Time  
and by appointment.

Lecture:  Lecture videos can be found on Blackboard.  Although this is an  
asynchronous course, you should keep up with the schedule as given on  
the course syllabus.

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 Blackboard.  Also check the course website.

Computing:  The preferred computing package is JMP.  This program can be  
downloaded for free by following the instructions at  
www.stat.iastate.edu/resources/software-sasjmpr/.  Students may use other  
statistical computing packages, e.g. Minitab but there is no guarantee that  
the instructor can help if you run into problems using a package other than  
JMP.  In general Excel does not have sufficient capability for the types of  
statistical analyses we will be doing in this class.

Exams:  Exam 1: Week of September 29  
Exam 2: Week of November 3  
Final Exam: Week of December 15

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 on Blackboard.

Grading:  Final course grades will be based on your performance on exams and  
homework assignments.  The breakdown of points is as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>100 pts</td>
</tr>
<tr>
<td>Exam 2</td>
<td>100 pts</td>
</tr>
<tr>
<td>Final Exam</td>
<td>130 pts</td>
</tr>
<tr>
<td>Homework</td>
<td>100 pts</td>
</tr>
<tr>
<td>Project</td>
<td>70 pts</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>500 pts</td>
</tr>
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# Tentative Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture # Material Covered</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section 1</strong></td>
<td></td>
<td></td>
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</tbody>
</table>
| Week of August 25 | 1. Introduction and the Big Picture.  
2. Statistical thinking.                      |                                   |
| Week of September 1 | 3. Quality improvement, Six Sigma.  
4. Actions based on data, Analytic vs. Enumerative studies. | Sections 1.1, 1.2, 1.3, 1.6  
Sections 2.1, 2.2, 2.3  
Sections 4.1, 4.2  
Homework #1 assigned. |
| Week of September 8 | 5. Magnificent 7: Part 1 Flow charts, cause and effect, Pareto charts.  
6. Magnificent 7: Part 2 Histograms, scatterplots, stratification, run charts. | Section 6.7  
Sections 3.1, 3.2, 3.5  
**Homework #1 due.**  
Homework #2 assigned. |
| Week of September 15 | 7. Data and specifications.  
8. Measurement and gauge R&R.                  | **Homework #2 due.**  
Homework #3 assigned. |
| Week of September 22 | 9. Statistical control.  
10. Review for Exam 1 | Sections 5.7, 5.8  
**Homework #3 due.** |
| Week of September 29 | *****Exam 1*****                                                                                |                                   |
| **Section 2**   |                                                                                          |                                   |
| Week of September 29 | 11. Introduction to control charts.                                                        | Sections 5.1, 5.2, 5.3 |
| Week of October 6 | 12. $\bar{X}$ & $R$ charts: construction.  
13. $\bar{X}$ & $R$ charts: interpretation. | Sections 6.1 – 6.5  
Sections 6.6 – 6.8  
Homework #4 assigned. |
15. Other charts for measurement data. | Sections 9.1, 9.2, 9.3  
**Homework #4 due.**  
Homework #5 assigned. |
| Week of October 20 | 16. Control charts for count data: number defective.  
17. Control charts for count data: number of defects. | Sections 13.1 – 13.4  
Sections 13.5, 13.6  
**Homework #5 due.**  
Homework #6 assigned. |
| Week of October 27 | 18. Assumptions, caveats and cautions.  
19. Review for Exam 2 | **Homework #6 due.** |
<p>| Week of November 3 | <em><strong><strong>Exam 2</strong></strong></em>                                                                                |                                   |</p>
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<tr>
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<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week of November 3</td>
<td>20.</td>
<td>Statistical thinking revisited.</td>
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<td></td>
<td>Section 3</td>
<td></td>
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<tr>
<td>Week of November 17</td>
<td>23.</td>
<td>Quantifying sources of variation, nested designs.</td>
<td>Homework #7 due.</td>
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<td>24.</td>
<td>More on nested designs.</td>
<td>Homework #8 assigned.</td>
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<tr>
<td>Week of November 24</td>
<td>Thanksgiving Break</td>
<td></td>
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<tr>
<td>Week of December 1</td>
<td>25.</td>
<td>Enumerative studies, definitions.</td>
<td>Section 3.3</td>
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<td>26.</td>
<td>Enumerative studies, probability.</td>
<td>Homework #8 due.</td>
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<td>Homework #9 assigned.</td>
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<tr>
<td>Week of December 8</td>
<td>27.</td>
<td>Enumerative studies, inference.</td>
<td>Homework #9 due.</td>
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<td>28.</td>
<td>Philosophy of quality, review for final exam.</td>
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<tr>
<td>Week of December 15</td>
<td><em><strong>Final Exam</strong></em></td>
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**Course Information and Policies**

- **Disability**: Iowa State University complies with the Americans with Disabilities Act and Sect 504 of the Rehabilitation Act. If you have a disability and anticipate needing accommodations in this course, please contact Dr. Bob Stephenson, 3111 Snedecor Hall, 294-7805, wrstephe@iastate.edu, within the first two weeks of the semester so that your learning needs may be appropriately met. Before meeting with Dr. Stephenson, you will need to obtain a Student Academic Accommodation Request (SAAR) form with recommendations for accommodations from the Disability Resources Office, located in Room 1076 on the main floor of the Student Services Building. Their telephone number is 515-294-7720.

- **Academic Dishonesty**: This class will follow Iowa State University policy on academic dishonesty found in the Iowa State University Catalog. A score of zero will be given for the entire assignment in which academic dishonesty occurs.

- **Exams**: You will be able to use a calculator during exams. You will be able to use formula sheets and certain other material during exams. You will be told what you can use for each exam and should bring those materials with you to the exam.

- **Final Exam**: The final exam is scheduled for the week of December 15. **Do not make plans for semester break that conflict with your final exam schedule.**

- **Project**: There will be a project that will be due the last day of classes, Friday, December 12.