Syllabus for ISE 352

*Design of Experiments*

Fall Semester 2009
TR 3:05 – 4:15 p.m.
EGC 218/216B

**Instructor:** Dr. Laura Moody, Associate Professor
Department of Industrial Engineering and Industrial Management

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**Textbooks and Supplies:**

**Web Site:** http://faculty.mercer.edu/moody_le/ise352.htm

**Class Listserv:** ISE35200109F@mercer.edu

**Catalog Description:**
Advanced model designs (fractional factorials, Latin squares, nested, etc.)
Estimation of model parameters and model adequacy checking. Multiple regression.
Response surface methodology and Taguchi methods.

**Course Objectives:**
Upon successful completion of this course, you should be able to do the following:

1. Plan an experiment.
2. Identify the appropriate experimental method.
3. Develop a detailed experimental design.
4. Conduct and analyze the results of an experiment.
5. Draw appropriate conclusions and specific recommendations.

**Prerequisites:** C or better in EGR 252


Grading:

Homework/Labs 20%
Team Project 20%
Exam 1 (10/1) 15%
Exam 2 (11/19) 20%
Final Exam (12/15) 25%

Course Standards:

1. **Assignments are due at the beginning of the class period on the date due.** The due date and point values for these assignments will be announced when the assignments are made. Late assignments will lose 5% of the point value per day, including weekends. Homework assignments that are not of acceptable quality (neat, readable, etc.) will be returned for revision and late penalties will apply.

2. Homework assignments are to be individual efforts. While I encourage you to work together to complete the homework, you should be sure that the assignment you turn in represents your own understanding of the material. Homework submissions that appear to be exact duplicates will risk sharing the points awarded to the assignment. Some assignments will be treated as lab exercises and may require you to work in teams of two or three (specifics will be given on each assignment.)

3. **Group Project:** An important part of this course will involve students working in teams to engage in a project similar to one that might be required of an engineer in industry. Grading will be based on overall group grades, adjusted for individual effort and performance.

4. There will be two midterm exams and one final exam. Midterm exams will be closed-book, closed-notes. You will be allowed one 8½ x 11 sheet of handwritten notes (your own handwriting). I will provide all necessary tables and charts. The final exam will be open book. **No make-up exams will be given.**

5. Please turn off cell phones and pagers before entering the classroom.

6. The **honor code** provisions as outlined in the *Bulletin* and in the student handbook, *The Lair*, will be assumed for everyone. Plagiarism is a violation of the honor code and is prohibited.

7. Students requiring accommodations for a disability should inform the instructor at the close of the first class meeting or as soon as possible. If you are not registered with Disability Services, the instructor will refer you to the Disability Support Services office for consultation regarding documentation of your disability and eligibility for accommodations under the ADA/504. In order to receive accommodations, eligible students must provide each instructor with a "Faculty Accommodation Form" from Disability Services. Students must return the completed and signed form to the Disability Services Coordinator on the 3rd floor of the Connell Student Center. Students with a documented disability who do not wish to use academic accommodations are also strongly encouraged to register with Disability Services and complete a Faculty Accommodation Form each semester. For further information, please contact Carole Burrowbridge, Disability Services Coordinator, at 301-2778 or visit the website at [http://www.mercer.edu/stu_support/swd.htm](http://www.mercer.edu/stu_support/swd.htm)

8. This syllabus is subject to change. Changes will be announced in class and will appear on the class web site.
Through the course of this semester, the following topics will be explored:

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<tr>
<th>Week</th>
<th>Topic</th>
<th>Chapter</th>
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<td>1</td>
<td>Introduction / Simple experiments</td>
<td>1 &amp; 2</td>
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<td>2</td>
<td>Analysis of Variance</td>
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<td>3</td>
<td>Randomized blocks, latin squares, etc.</td>
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<td>Factorial designs</td>
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<td>5</td>
<td>$2^k$ factorial design</td>
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<td>Blocking &amp; confounding</td>
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<td>2-level fractional factorial designs</td>
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<td>8</td>
<td>3-level and mixed-level factorial &amp; fractional factorial designs</td>
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<td>9</td>
<td>Fitting regression models</td>
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<td>Response surface methods &amp; designs</td>
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<td>Robust parameter designs &amp; process robustness studies</td>
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<td>Experiments with random factors</td>
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<td>Nested &amp; split plot designs</td>
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<td>Other topics / review</td>
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<td>Dec. 15</td>
<td><strong>FINAL EXAM</strong> (7 – 10p.m.)</td>
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