Mechanical & Materials Engineering
Engineering Building, Suite 400
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Portland State UNIVERSITY

Course Number	**ME 488**
Title	**Design of Experiments**
CRN	**11664**
Credits	**2**
Prerequisite(s)	**Stat 451 CM**
Days/Time	**Mondays, 4:00 – 5:50 PM**
Location	**Engineering Building, Room 103**
Final Exam Day/Time	**Monday, 7 December 2009, 3:30 – 5:20 PM**

Course Website	**web.cecs.pdx.edu/~gerry/class/ME488**

Instructor	**Gerald Recktenwald**
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Office Hours	**Tuesdays, 4:00 – 5:30 PM**
Mailbox Location	**ME Office, EB 400 Suite**

Required Text or Other Materials:

Applied Statistics for Engineers and Scientists Using Microsoft Excel and MINITAB, David M. Levine, Patricia P. Ramsey and Rober K. Smidt, 2001 Prentice-Hall. Students can buy either the hardcover or paperback editions.

Catalog Course Description:

Presents the methods of planning the data collection scheme in industrial experimentation. Topics to be covered are methods of statistical inference, randomization, blocking, empirical and mechanistic model building using factorial, fractional factorial designs, and least squares methods.

Course Objectives – Students must demonstrate the ability to:

1. Design one-factor, two level experiments with a fully randomized design and analyze results with one-way ANOVA
2. Design one-factor, two level experiments with a fully randomized design and analyze results with two-way ANOVA
3. Develop empirical models for multi-factor problems using full factorial designs and analysis
4. Develop linear multiple regression models for more general multi-factor modeling problems.
5. Use MINITAB as a tool to design and analyze problems relevant to the preceding objectives

Course Requirements:

Students will complete weekly homework assignments using hand calculators, spreadsheets, and MINITAB. On exams, students are expected to be able to perform all statistical computations by hand (ie. without MINITAB or spreadsheets) when given appropriate reference tables.

Course Grading

Assignment	**Points Assigned or % of Total Grade**
Homework	20 %
Midterm	30 %
Final Exam	50 %

Incompletes: A grade of "I" is granted by the instructor *only* with prior approval and consent. Criteria are outlined in the PSU Bulletin. Poor performance in the class is not a valid reason for granting an I (incomplete).

Program requirements: {for UG courses} The ME Department requires that junior and senior engineering courses must be completed with a minimum grade of C-, and a student's cumulative PSU GPA must be 2.00 or higher to graduate from the BSME program.

Course Schedule

Homework assignments will be given as handouts in class. The assignments will consist of problems from the textbook and case studies involving other data sets.

No	Date	Topic	Reading Assignment
1	9/28/09	Introduction, MINITAB demonstrations	Review chapters 1, 3, 5, 9; MINITAB tutorial #1
2	10/5/09	Single factor designs	10.1, 10.2
3	10/12/09	Single factor designs, ANOVA	10.3, 10.4
4	10/19/09	Single factor designs	10.5
5	10/26/09	Midterm exam	11.1, 11.2
6	11/2/09	Factorial designs	11.1, 11.2
7	11/9/09	Factorial designs	11.3, 11.4
8	11/16/09	Regression analysis	12.1, 12.2, 12.3, 12.4
9	11/23/09	Regression analysis	12.5, 12.6, 12.7
10	11/30/09	Review, tie up loose ends	

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