

ISE 525 Design of Experiments
Spring Semester 2016
M,W 2:00 - 3:20 pm
Room: OHE 120
Web site: www.uscden.net

Kurt Palmer
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Recommended Preparation: ISE 225 Engineering Statistics I (or equivalent)

Objective: In this course, you will develop the skills necessary to plan efficient data collection activities, derive empirical models of physical systems, and perform sequential optimization studies based upon the empirical models.

Text: Myers, Montgomery, and Anderson-Cook, Response Surface Methodology, third edition

Course Material: Chapters 1-7 and 10 of the text, plus topics discussed in lecture by the instructor

Grading Policies:

Points Breakdown -

Homework	90
Project	150
Exam #1	140
Exam #2	<u>120</u>
Subtotal	500
Final Exam	150

Course GRADES will be determined by the distribution of point totals for the class. “Natural groupings” will be used to assign letter grades. The highest scoring group will receive A’s, the next group is the B’s, and so on. A single point will not be the difference between any two letter grades. A “gap” must exist to create a grade boundary.

HOMEWORK assignments will be due on the following Wednesdays:

January 27; February 3, 10; March 2, 9, 23

Homework will be graded on an “all or nothing” basis. If a paper shows an answer to each assigned exercise that uses approximately the correct method, the grade for the assignment is 15 points. If any exercise is unacceptable, the grade for the assignment is 0 points. Late assignments will be accepted until the Monday following the original due date.

A PROJECT will be due on the following date:

Monday, April 18

The project will involve investigation and optimization of a response surface. You will collect data from a computer simulation, in order to model the surface. For this project, you may work either individually or in pairs. The project assignment will be distributed about two or three weeks in advance of the due date.

An EXAM will be given on each of the following dates:

Wednesday, February 17 and Wednesday, March 30

Each exam will cover the material presented up to and including the preceding homework assignment. Points will be assigned to each section of the exam. Partial credit will be awarded according to work shown. No re-takes will be allowed. No make-up exam will be given. If you miss an exam, you must take the final exam.

The FINAL EXAM is scheduled for **Monday, May 9, at 2:00-4:00**. It will be comprehensive and will be graded similarly to the other exams. A student may elect to omit the final exam, if both exams and the project have been completed.

Week	Topic(s)	Text Sections
1	Response Surface Studies, Simple and Multiple Linear Regression	1.1, 2.1 - 2.3
2	Regression Significance	2.4 - 2.5
3	Model Selection and Diagnostics	2.6 - 2.8, Handout
4	Response Transformations, Factorial Experiments	2.10, 3.2
5	Coded Variables, Orthogonality, Lack of Replication, Center Points	3.3 - 3.6
6	Exam	
7	Blocking, Fractional Factorial Experiments	3.7, 4.2
8	Multi-factor Experiment Workshop	
9	Deconfounding, Fold-Over, Steepest Ascent	4.3 - 4.6, 5.1, 5.3, 5.5
10	Canonical Analysis, Ridge Analysis, Design Properties	5.2, 6.2 - 6.4, 7.1 - 7.2
11	Central Composite Design, Exam	7.3 (omit 7.3.3), 7.4.1
12	Central Composite Design (cont.), Multiple Responses	7.4.2 - 7.4.6, 6.6
13	Taguchi's Parameter Design	10.2 - 10.3
14	Combined Array/Response Model Approach	10.4 - 10.5
15	Project Review, Course Evaluation	

Academic Integrity:

The Department of Industrial and Systems Engineering adheres to the University's policies and procedures governing academic integrity as described in SCampus. Students are expected to be aware of and to observe the academic integrity standards described in SCampus. Students should expect those standards to be enforced in this course.

Accommodations for Disabilities:

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to the instructor as early in the semester as possible. DSP is located in GFS 120 and is open 8:30 am - 5:00 pm, Monday through Friday. The phone number for DSP is (213)740-0776.