

King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
STAT530: Design and analysis of experiments
Term 202

Instructor: Dr. Muhammad Riaz

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Office Hours: 10:00 am – 12:00 noon UT (Online)

Course Objectives: Preparing students to design experiments, and to use statistical techniques therein that help make objective decisions in the face of uncertainty.

Course Description:

STAT 530: Design and Analysis of Experiments (3-0-3)

Completely randomized design. Randomized block design. Latin square designs. Models: Fixed, random, and mixed models. Incomplete block design. Factorial experiments 2k designs. Confounding in 2k designs. Nested and Split-plot designs. Fractional and orthogonal designs. Fractional replicate and orthogonal designs. Using statistical packages (e.g. Statistica, Minitab, SAS, SPSS, etc.) to analyze real data sets.

Pre-requisite: Graduate standing

Textbook: Montgomery, D.C. (2019). Design and Analysis of Experiments. 10th edition, Wiley, New York.

Software: Minitab.

Assessment*

Activity	Weight
Class Evaluation (homework, quizzes, attendance, participation, etc.)	15%
Project	15%
Mid Term Exam	30%
Final Exam (Comprehensive)	40%

Grade Assignment

Relative Grading based on overall performance of the students registered in this course.

Academic Integrity

All KFUPM policies regarding **ethics** and **academic honesty** apply to this course.

General Notes

Students are encouraged to regularly check the blackboard announcements.

Schedule (tentative)

Week	Topic
1	Introduction to Designs of Experiments and Basic Principles
2	Layouts of experimental Designs and Analysis of Variance Technique
3	Blocking and Experiments with blocking Factors
4	Factorial Experiments
5	Two and Three Level Factorial Designs
6	Blocking and Confounding for Two and three Level Factorial Designs
7	Blocking and Confounding for Two and three Level Factorial Designs (Cont...)
8	Two and three level Fractional Factorial Designs
9	Two and three level Fractional Factorial Designs (Cont...)
10-11	Nested Designs
12-13	Split plot and strip plot designs
14-15	Analysis of Covariance
15	Robust Designs