

San José State University
College of Engineering- Department of Aviation & Technology
TECH 233, Design and Analysis of Experiments
Fall 2012

Instructor:	Ali M. Zargar, Ph.D.
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Office Hours:	T&R 10:30 – 12:00 & R 3:00 – 5:00
Class Days/Time:	Wednesday 6:00 – 8:45 PM
Classroom:	IS 120
Prerequisites:	TECH 232

Course Description

Experimental design has applications in many branches of science and industry. It is the purpose of this course to provide and insight into the methodology used to define a statistically structured experiment. A series of coherent tests will be analyzed as a whole to gain an understanding of the process.

Course Goals and Student Learning Objectives

Upon completion of this course the student will be able to

- Identify problems or potential problems in a given process
- Plan and conduct experimental designs
- Interpret the results
- Make recommendations in choosing a course of action to improve productivity.

Required Texts/Readings

Moen, R. D., Nolan, T. W., & Provost, L. P. (1998). Improving quality through planned experimentation. New York: McGraw-Hill.

Other Readings

Reference

Montgomery, D. C. (2012). Design and Analysis of Experiments. New York: John Wiley & Sons. ISBN 978-1- 1181- 4692-7

Classroom Protocol

There will be one three-hour lecture each week. Pop in-class problems/quizzes will be given during lecture and homework problems will be assigned. No make ups. Late assignments will earn only a fraction of the allotted points up to 50%.

There will be one final and one midterm in addition to group project(s). There will be no make up for the final and the midterm. If for some reason, beyond your control, you cannot take the test you must inform the instructor in advance, obtain an agreement and set up a mutually convenient time to take the test.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the [current academic calendar](http://www.sjsu.edu/academic_programs/calendars/academic_calendar/) web page located at http://www.sjsu.edu/academic_programs/calendars/academic_calendar/. The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

Assignments and Grading Policy

Grading

Homework/In-Class Assignments	20%
Project & Cases	30%
Midterm	20%
Final	30%

100% = A+; 95-99% = A; 90-94=A-; 85-89% = B+, 80-84% = B; 75-79% = B-;

70-74% = C+; 65-69% = C; 60-64% = C-; 55-59% = D+; 52-54% = D; 50-51% = D-;

Below 50% = F.

University Policies

Academic integrity

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The [University's Academic Integrity policy](http://www.sjsu.edu/senate/S07-2.htm), located at <http://www.sjsu.edu/senate/S07-2.htm>, requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sa.sjsu.edu/judicial_affairs/index.html) is available at http://www.sa.sjsu.edu/judicial_affairs/index.html.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without

giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Policy S07-2 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with the [Disability Resource Center](http://www.drc.sjsu.edu/) (DRC) at <http://www.drc.sjsu.edu/> to establish a record of their disability.

Policy S12-3

“Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of forty-five hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practice. Other course structures will have equivalent workload expectations as described in the syllabus.”

TECH 233, Design and Analysis of Experiments Fall 2012

Table 1 Course Schedule

Week	Date	Topics, Readings, Assignments
1	8/22/12	Improvement of Quality – <i>Introduction, Improvement of Quality, Models for Improvement (video)</i>
2	8/29/12	Improvement of Quality Continued – <i>Chapter 1</i>
3	9/05/12	Testing a Change – <i>Prediction and Degree of Belief Using PDSA Cycle to Test a Change, Principles of Testing Change, Analysis of Data from Test of Changes - Chapter 2</i>
4	9/12/12	Testing a Change Continued
5	9/19/12	Principles of Design and Analysis of Planned Experiments – <i>Definitions, Type of Experiments, Principles for Designing Analytic Studies, Tools for Experimentation, Forms for Documentation of Planned Experiments, Analysis of Data from Analytic Studies - Chapter 3</i>
6	9/26/12	Principles of Design and Analysis of Planned Experiments Continued
7	10/03/12	Experiments with One Factor – <i>General Approach to One-Factor Experiments, Using Control Charts for a One-Factor Experiments, Paired-Comparison Experiments, Randomized Block Designs, Incomplete Block Designs - Chapter 4</i>
8	10/10/12	Midterm (<i>Will cover all the materials covered to this point</i>) Midterm will be 90 minutes long.
9	10/17/12	Experiments for More than One Factor – <i>Introduction to Factorial Designs, Design of Factorial Experiments, Analysis of Factorial Experiments - Chapter 5</i>
10	10/24/12	Reducing the Size of Experiments – <i>Introduction to Fractional Factorial Designs, Moderate Current Knowledge Fractional Factorial Designs, Low Current Fractional Factorial Designs, Blocking in Factorial Designs - Chapter 6</i>
11	10/31/12	Evaluation Sources of Variation – <i>Control charts as Nested Designs, Nested Design to Study Measurement Variation, A Three-Factor Nested Experiment, Planning and Analyzing Experiments with Nested Factors - Chapter 7</i>
12	11/07/12	New Product Design - <i>Chapter 9</i>

Week	Date	Topics, Readings, Assignments
13	11/14/12	New Product Design - <i>Chapter 9 continued</i>
14	11/21/12	Pre-Thanksgiving Holiday – <i>No Class</i>
15	11/28/12	<i>Continue working on your projects – Review for the Final.</i>
16	12/05/12	Project Presentation
Final Exam	12/12/12	Final (Comprehensive) – Thursday – 5:15 – 7:30