**Course Description**

→ This course examines how to design experiments of physical, engineering or industrial sciences, carry them out, and analyze the data they yield.

→ Concepts of simple comparative experiments, randomization, blocking, analysis of variance and covariance are discussed.

→ The designs that are studied include Latin squares, factorial and fractional factorial designs as well as response surface methodology.

**Course Objectives**

→ Understand the principles and the mathematical models associated with experimental designs.

→ Design and perform the statistical analysis of an experiment.

→ Utilize SAS or Python for the purpose of analyzing statistical data.

→ Learn to communicate the results of a statistical analysis through oral and written presentations.

**Academic Integrity**

It is expected that all students will support the idea of academic integrity and be responsible for the integrity of their work. The university has a published policy on academic integrity that may be found at http://www.library.illinois.edu/learn/research/academicintegrity.html
**Homework Assignments:** There will be 8 homework assignments throughout the semester that will account for 20% of the course grade. All students are required to submit a hard copy of the hw before the beginning of the lecture it is due. No late homework will be accepted.

**Case Studies:** There will be 3 group case studies throughout the semester that will account for 10% of the course grade.

**Exams:** There will be 2 in class exams, each one accounting for 20% of the course grade.

**Group Project:** There will be a group project due in the last lecture. Each group has to perform an experiment, analyze and present the results in a written report as well as a 10-min oral in-class presentation. Project groups will be assigned using CATME (http://info.catme.org). The project will account for 25% of the course grade.

**iClickers:** There will be iClicker questions during lectures (approx. 3-4 per lecture). You will get 0.7 points just for responding, plus 0.3 points for giving a correct answer per question. The 2 lowest iClicker sessions will be dropped and the iClicker points will account for 5% of the course grade. Bringing somebody else’s iClicker in the classroom is considered cheating & appropriate actions will be taken.

**Graduate Students:** Students registered for 4 credits will be required to complete additional problems in the exams/assignments.

**Software**

In the assignments, case studies, and project, you are required to use appropriate software. You can use either SAS or R.

- **SAS:** SAS@OnDemand for Academics (web editor) is set up to use (for free) for the course. Windows users can also purchase SAS from the University of Illinois Webstore.
- **R:** R is an open-source statistical software that can also be used for the needs of the course.

*More details can be found on the course website.*