

**MA 546 Design and Analysis of Experiments
Fall 2012**

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Office Hours: Friday 1:00 – 2:00pm, or by appointment.

Lecture Time and Location: Thursday 5:30 - 8:20pm, Stratton Hall 203.

Textbook:

George Casella, *Statistical Design*, Springer
Gary W. Oehlert, *A First Course in Design and Analysis of Experiments*, Freeman.

Reference Book:

Gouglas C. Montgomery, *Design and Analysis of Experiments (8th edition)*, John Wiley & Sons.

Online Course Materials: Online blackboard at <http://my.wpi.edu>.

Prerequisite: Knowledge of basic probability and statistics at the level of MA 511 (Applied Statistics for Engineers and Scientists) is assumed, including estimation and confidence intervals, tests of hypotheses, and regression analysis.

Course Goal and Objectives

This course is an introduction to the statistical design and analysis of experiments. The general goal of this course is for students to learn the concepts and methods of both designing experiments and analyzing the corresponding data. Students will study the rationale behind these methods and develop abilities to apply appropriate methods for addressing scientific questions through experimental design and analysis.

Topics covered in this course include the plan and analysis of completely randomized designs, nested designs, complete and incomplete block designs, split plot designs, etc. Emphasis will be on the application of the theory to real data using statistical computer packages.

Grading

In-class performance	5%
Homework	35%
Midterm	25%
Final	35%

Final letter grades also take your background and efforts into consideration.

Homework

To get the full credit, you need to hand in a hard copy of your HW report and email me you codes (if any). Your HW report shall include (if applicable):

- Derivation (if mathematical questions),

- Essential outcomes (**do NOT copy and paste any statistical program output**) and conclusions
- Brief and clear explanations
- Program codes (as the attachment of the report).

Collaboration is not allowed, and evidence of collaboration will be considered as academic dishonesty.

Midterm

The take-home exam will be given on October 11th and due on October 25th.

No collaboration is allowed.

Final

Part 1: Take-home questions, due on December 14th.

Part 2: Class project and presentation. Individual work is preferred; collaboration needs to be approved in advance with expectation of higher quality. Your project can be either a research on relevant statistical topic or a practice of generating data to address an interesting question in life or in your scientific field. Details will be announced at the second half of the semester.

Statistical Program R

To download and install R: <http://www.r-project.org>.

A comprehensive R tutorial: <http://cran.r-project.org/doc/manuals/R-intro.html>.

Sample R codes will be shown and provided to you in classes.

Academic Honesty

Each student is expected to familiarize him/herself with WPI's Academic Honesty policies, which can be found at <http://www.wpi.edu/Pubs/Policies/Honesty>. All acts of fabrication, plagiarism, cheating, and facilitation will be prosecuted according to the university's policy. If you are ever unsure as to whether your intended actions are considered academically honest or not, please see me.

Students with Disabilities

Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Disability Services Office (DSO) as soon as possible to ensure that such accommodations are implemented in a timely fashion. The DSO is located in the Student Development and Counseling Center and the phone number is 508-831-4908, e-mail is DSO@WPI.EDU. If you are eligible for course adaptations or accommodations because of a disability (whether or not you choose to use these accommodations), or if you have medical information that I should know about please make an appointment with me immediately.