STAT 7360
Optimal Design of Experiments
Fall Term 2011

Instructor: Dr. Saumen Mandal

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Time, Location & CRN: Slot 10 (Tu/Th, 1:00 p.m. – 2:15 p.m.), 316 Machray Hall. CRN: 15022.

Office Hours: Tuesdays & Thursdays: 11:45 a.m. – 12:45 p.m.
Wednesdays: 10:00 a.m. – 11:00 a.m.
and by appointment or whenever I am in.

Course Description: This course will explore various topics on optimal experimental design. In the beginning, you will notice that we will be revisiting some topics in matrix algebra and linear models. The following is a list of topics to be covered in the course:

- Optimal design theory
- Exact and approximate designs
- Optimality criteria
- Directional derivatives
- Optimality conditions
- Optimal designs for different regression models
- Optimal design for independent estimation of parameters
- Algorithms
- Construction of optimal designs
- Constrained optimization and applications

Textbook: You do not have to buy a textbook for this course. Detailed notes will be provided in the class. The following are some suggested references:

Atkinson, A.C. and Donev, A.N. (1992). *Optimum Experimental Designs*. Clarendon Press, Oxford. (A copy of this book is on reserve in the Science and Technology Library.)

Atkinson, A.C., Donev, A.N. and Tobias, R.D. (2007). *Optimum Experimental Designs, with SAS*. Oxford University Press, Oxford. (Available as an E-book through the Library.)

Berger, M.P.F. and Wong, W.K. (2009). *An Introduction to Optimal Designs for Social and Biomedical Research*. John Wiley & Sons.

Grading Scheme: Your grade will be based on two assignments and final exam according to the following weights: Assignments - 30%, Final Exam - 70%.

The date and location of the final exam will be given later. You can check the information/announcements in the U of M JUMP: http://jump.umanitoba.ca/

Note on Assignments: Students are encouraged to discuss and share their ideas on the solutions to the assignments. However, students must write up the assignment on their own. Include a cover page with your name, student number, and course number. Late assignments will not be accepted.

Actions will be taken against students who are found guilty of acts of academic dishonesty.

Miscellaneous: I have been asked to draw your attention to the sections in the *University of Manitoba Graduate Calendar* dealing with academic dishonesty including "plagiarism and cheating" and "examination personation".