

University of Guelph
Department of Mathematics and Statistics
Course Outline: Stat*3210 Winter 2017
Experimental Design

General Information

Course Title: Stat*3210: Experimental Design

Course Description: This course presents the basic principles of design: randomization, replication, and local control (blocking); RCBD, Latin square and crossover designs, incomplete block designs, factorial and split-plot experiments, confounding and fractional factorial designs, response surface methodology; linear mixed model computer analysis of the designs; nonparametric methods; Taguchi philosophy.

The above is the official description in the course calendar.

Credit Weight: 0.5

Academic Department (or campus): Mathematics & Statistics

Campus: University of Guelph

Semester Offering: Winter 2017

Class Schedule and Location: Tuesday & Thursday, 10:00 to 11:15 a.m., in SSC 1303. On occasion a class may be held elsewhere, for example if we have a “field trip”. You need to watch for news on our course website.

Instructor Information

Instructor Name: Gary J. Umphrey

Instructor Email: umphrey@uoguelph.ca

Office Phone: (519) 824-4120 x53288

Office location and office hours: MacNaughton 551, Monday 10:30-12:30 and Thursday 1:00-3:00.

Course Content

Specific Learning Outcomes:

I try to optimize the educational outcomes for each student in the course. Specifically some of the outcomes I consider desirable are:

- Increase the breadth and depth of your knowledge in the statistical field of Experimental Design.
- Improve your capacity to plan and implement designed experiments and to analyze and interpret the data generated.
- Strengthen your understanding of the contribution of designed experiments towards scientific inference.
- Gain a stronger appreciation of the issues and tradeoffs that researchers face in attempting to design experiments that are efficient for generating desired information.
- Strengthen your understanding of the role of mathematical models for condensing and communicating information.
- Improve your capacity to communicate statistical results to other researchers.

Lecture Content:

Lectures vary a lot in style and content, you need to be there to understand what is going on!

Labs:

This course does not have a lab, but you will be working with hands-on statistical analyses using R during some of lecture times. You will also have access to an open “R” lab in SSC 1303, staffed by a GTA with a high level of ability in the use of R statistical software. The hours of the R lab are Monday to Friday, 12:30-2:30 p.m.

The computers in SSC 1303 have R installed on them. You cannot save files for the longer term on these computers, so you will want to email files to yourself or store them on a memory stick.

The R lab will be used by other courses, such as Stat*2040 and Stat*2050, so at times the GTA will be inundated by students seeking assistance. Try to plan to access the lab in lower demand times and please be patient!

Course Assignments and Tests:

Assignments: 3 of them, equally weighted, worth: 25%

Assignment due dates are: Tuesday January 24
Thursday February 16
Thursday March 23

Project, due on Friday April 7, worth: 25%

Test on Monday March 6, worth: 20%

Exam on Tuesday April 18, worth: 30%

Final examination date and time:

Tuesday April 18, 2017 at 7:00–9:00 p.m.

The final exam will be “open notes”, but no computer, cellphone etc will be permitted. As for the Test, you will want a decent calculator with you.

Course Resources

Required Texts:

The “required” text is “Design of Experiments: Statistical Principles of Research Design and Analysis”, second edition, by Robert O. Kuehl (2000). This semester we will also make use of Gary Oehlert’s (2000) text, “A First Course in Design and Analysis of Experiments”, which Dr. Oehlert has generously made available for free as a pdf download. You can find the link here:

<http://users.stat.umn.edu/~gary/Book.html>

Recommended Texts:

See “Required Texts”.

Other Resources:

I like short in-class handouts. I do not post notes; I expect you to be at class to make your own notes. If you are absent from a class for any reason you need to negotiate with a class colleague to get the notes you missed!

Course Policies

Grading Policies

Assignments/Projects will be submitted electronically, details to be posted on our course website. Deadlines are strictly enforced, unless I decide otherwise. A penalty of 20% per day for up to two days can be imposed for late assignments or a late project, thereafter the assignment or project may not be accepted.

The Test and Exam are “open notes”. You will want a hand calculator but computers, cellphones and other such devices are not allowed.

Course Policy on Group Work:

Some assignments may allow group work on one or more components. Explicit rules for such components can vary, and will be detailed with the assignment guidelines.

Course Policy regarding use of electronic devices and recording of lectures

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are permitted they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

Additional Course Information

I expect you to be able to attend class, this is not a DE course!

University Policies

Academic Accommodation of Religious Obligations

If you are unable to complete a course requirement due to religious obligations, please let the instructor know within the first two weeks of class. See the academic calendar for more information:

https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e2268.shtml

Academic Consideration

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact. See the academic calendar for information on regulations and procedures for Academic Consideration:

https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e2232.shtml

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and

students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Graduate Calendar:

https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e2709.shtml

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Student Accessibilities Services (SAS) as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: <http://www.uoguelph.ca/csd/>

Also see:

https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e2395.shtml

Course Evaluation Information

Please see:

https://mathstat.uoguelph.ca/sites/uoguelph.ca.mathstat/files/public/TeachevaluationformW16_1.pdf

Drop date

The last date to drop one-semester courses, without academic penalty, is **Friday, March 10, 2017**.

For regulations and procedures for Dropping Courses, see the Academic Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>