

# Course Outline: Stat\*6950 Fall 2016

## Statistical Methods for the Life Sciences

### General Information

**Course Title: Stat\*6950: Statistical Methods for the Life Sciences**

**Course Description:** Analysis of variance, completely randomized, randomized complete block and latin square designs; planned and unplanned treatment comparisons; random and fixed effects; factorial treatment arrangements; simple and multiple linear regression; analysis of covariance with emphasis on the life sciences. STAT\*6950 and STAT\*6960 are intended for graduate students of other departments and may not normally be taken for credit by mathematics and statistics graduate students.

The above is the official description in the course calendar. I will be adding some extra content that I think you should know, such as categorical data analysis and some nonparametric methods.

**Credit Weight:** 0.5

**Academic Department (or campus):** Mathematics & Statistics

**Campus:** University of Guelph

**Semester Offering:** Fall 2016

**Class Schedule and Location:** Tuesday & Thursday, 10:00 to 11:15 a.m., in Mackinnon 116. (If I could get a larger room I would, but this doesn't look likely.)

### Instructor Information

**Instructor Name:** Gary J. Umphrey

**Instructor Email:** [umphrey@uoguelph.ca](mailto: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:

- Improve your ability to understand, implement and interpret core statistical methodologies, especially in the areas of regression analysis and experimental design.

- Improve your capacity to design experiments and other research studies that will require subsequent quantitative analysis.
- Understand statistical language as employed in your research area and in science in general.
- Improve your capacity to communicate statistical results to other scientists.
- Gain an appreciation of some interesting statistical controversies!

### **Lecture Content:**

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

### **Labs:**

Instead of a “closed” lab, you will 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 10:30-12:30 (2 hours)  
 Tuesday 10:30-1:30 (3 hours)  
 Wednesday 10:30-12:30 (2 hours)  
 Thursday 10:30-11:30 (1 hour)  
 Friday 10:30-12:30 (2 hours)

The computers in this room 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/Projects: 4 of them, equally weighted, worth: 40%

Assignment due dates are: Tuesday September 27, 2016  
 Thursday October 13, 2016  
 Thursday November 10, 2016  
 Tuesday November 29, 2016

Test (held in-class) on Tuesday October 25, 2016, worth: 25%

Exam, Thursday December 15, 2016, worth: 35%

### **Final examination date and time:**

Thursday December 15, 2016 at 11:30am-1:30pm.

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:**

We will make use of texts made available electronically through the library; these have no cost to you. Here are two very useful books:

Regression Analysis by Example, 4<sup>th</sup> ed., by S. Chatterjee & A. S. Hadi (Wiley, 2006). Good chapters to download include 1–6, 11, and 12.

Design and Analysis of Experiments in the Health Sciences, by G. Van Belle and K. Kerr (Wiley, 2012). Good chapters to download include 1-5.

In addition to the mentioned chapters, you may want to download the pdfs for the front and back materials. Indeed you might want to download the entire book contents.

### **Recommended Texts:**

At various times I will recommend other potentially useful texts.

### **Other Resources:**

I post some slides on our course website and I like short in-class handouts. I do not post full 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. Failure to submit an assignment/project on time will result in a grade of 0.

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

Remember that a graduate course, including this one, requires a minimum grade of 65% to pass.

### **Course Policy on Group Work:**

Some assignments/projects may allow group work on one or more components. Explicit rules for such components can vary, and will be detailed with the assignment/project 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](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](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](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](mailto: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](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](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, November 4, 2016**. For regulations and procedures for Dropping Courses, see the Academic Calendar:

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