Course Outline for Statistics 3858b: Theory of Statistics Department of Statistical and Actuarial Sciences. University of Western Ontario

January, 2018

The course webpage is
http://fisher.stats.uwo.ca/faculty/kulperger/SS3858/Stat3858.htm

1. Instructor: R. J. Kulperger

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2. Text: J. A. Rice, Mathematical Statistics and Data Analysis, Third Edition (most recent), ISBN 0-534-39942-8

3. Coverage: Chapters 6 (review as needed), 8, 9, 10, 13 with the supplementary material discussed in class or in items posted on the course web site. There are a few definitions and ideas from Chapter 7 that are used, but the material on survey sampling theory and methods is not covered in this course. Some additional topics are studied which are not included in the Rice text. : (i) statistical models, parameter spaces and identifiability; (ii) parametric and nonparametric bootstrap; (iii) connecting probability theory to statistical inference, (iv) construction of QQ plots if not covered in Stat 3657a.

4. Course schedule: MWF 11:30 AM – 12:20 PM, WSC 240

   Tutorial Wednesday 5:30-6:30 PM, WSC 240. This room and time will also be used for two one hour tests that will constitute the mid-term. See the section on Grading below. The tutorial will be used for detailed worked problems and examples, as well as answering questions. Common errors from assignments will be discussed and corrected in these sessions.

5. Web page for the course:

   http://fisher.stats.uwo.ca/faculty/kulperger/SS3858/Stat3858.htm

   You may click on the following link to the webpage.

   http://fisher.stats.uwo.ca/faculty/kulperger/SS3858/Stat3858.htm

   Assignments and general announcements will be posted there. The user ID and password for this web site will be given in class.

   The semester starts on January 8, 2018 and ends on April 11, 2018.

6. Office Hours: to be announced in class. There are no office hours on the day of a test and exam. The course TA will also have one office hour, starting in week 2 or 3.

Course Description:

The course calendar description is given in

The course is an introduction to the basic concepts of statistical theory. Included in the syllabus are notions of statistical models, parameter identifiability, point and interval estimation, a paradigm for comparing estimators and statistical inference, method of moments and maximum likelihood estimators, hypothesis testing and application to contingency tables, sufficiency, Bayesian methods, and data analysis. The course will also give an introduction to bootstrap methods, including non parametric and parametric bootstrap, and the construction of QQ plots. Some of these topics have been introduced to students in earlier courses but are now studied in more depth and some of the topics are new to students.

To facilitate calculations R will be used for some assignments and examples. Some assignments will include the use of computing and simulation methods, done in R. Students from other disciplines may be able to do these in another programming language such as MatLab but should speak with me about the suitability of the software.

Course Objectives

At the end of this course the student should have developed an understanding of why statistical theory has developed as a tool to analyze random or noisy data. This will facilitate the student to apply these ideas to various areas such as actuarial science, financial modeling, scientific and other data.

Policies:

1. There will be no make up exam the mid-term. Absence at term test will result in a zero, unless permission is obtained from the Faculty of Science Counselors. If the faculty of science counselor agrees with the students reason and supporting documentation, then the entire weight of the mid-term test missed will be counted in the final exam. Their exam will have one question substituted to cover material missed in a term test. Such students *will identify themselves at the beginning of the exam and will then be given the appropriately modified exam.*

2. There will be about 5 assignments, handed out roughly every second week, but a slightly longer intervals around midterm time. Assignments are typically due one week after they are assigned. They are **DUE** at 11:30 AM at the **beginning** of class on the due date, unless otherwise stated in class.

3. The final exam will cover all the material covered in class, in the text and on the assignments. It will be cumulative, but with more emphasis on the later material course.

4. Grading:

Assignments	10%	the lowest assignment grade will be dropped, so there is no penalty for missing one assignment
Mid-term	35%	There will be two 50 to 60 minute tests in the Tutorial Hour, held from 5:30 - 6:30 PM in WSC 240. The two tests will be on Feb 7 and March 14, 2018.
Final Exam	55%	To be scheduled by the Registrar's Office.
		If a student scores higher on the final exam the midterm tests will count for 25% and the final exam will count for 65%

5. Formal notices : The following is a general statement for all courses at the University.

(a) Responsibility for checking prerequisites Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

(b) Statement on academic offences Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

(c) Statement on services for students in emotional/mental health distress Students who are in emotional/mental distress should refer to Mental Health@Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.

(d) Accessibility statement Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation

6. If a Student wishes to contact me by email they should use their uwo email. Other addresses are sometimes blocked by spam filters.