

Statistics 4657a/9657 : Probability II (formerly Statistics 450/550) Course Outline

September 2008

- Instructor : Professor R. J. Kulperger
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- Text : Probability and random processes. Oxford University Press. Geoffrey R. Grimmett and David R. Stirzaker. The text will be the latest edition.
- Lecture times : Wednesday and Friday 1:30 PM to 3 PM.
WSC Room 248
- Office hours : Friday after class 3 - 4 PM, or by appointment. I will often be in my office Thursday afternoon and will answer questions if time permits.
- Email policy : I will also try to answer course questions by email, usually within a day, perhaps longer on weekends.
- This course is a non-measure theoretic introduction to convergence tools commonly used in statistics. The course is based primarily on chapters 1, selected material from 2, 3, 4 and 5, and 7 of the text. The material on convergence is the most important part of this course.

Chapter 1 introduces the notion of sample or measure space, product spaces and independent random variables, and sequences of independent random variables. These are needed in order to understand the differences amongst the various modes of convergence discussed later in the course.

Chapter 2, 3 and 4 discuss distribution functions and conditional expectation. Chapter 5 discusses generating functions and characteristic functions, convergence in distribution, and the Continuity Theorem. It also discusses the weak law of large numbers and the central limit theorem. Chapter 7 discusses modes of convergence, and relations amongst these. If time permits we will also discuss an introduction to discrete time martingales.

- Goal of the course : The student should develop an appreciation of some basic tools of convergence in statistics, how to use some of these results in statistics, and some counterexamples illustrating difficulties in the interpretation of convergence results. A course in real analysis is helpful, but the basic ideas of convergence needed will be discussed during the course.

This main use in statistics is to understand how to apply the CLT where the conditions of this theorem do not apply directly. A secondary use is to help the student in reading and understanding the literature in probability, statistics, biostatistics, econometrics and related fields.

- Evaluation : There will be about 5 or 6 assignments, given at approximately 2 week intervals. There will be a written closed book exam and a take home exam. The written exam will be scheduled by the registrar's office. The length of the take-home exam will be 1 day.

The take home exam will be scheduled around scheduled written course exams of the students and *will be scheduled during the normal exam period*. See the university calendar for the dates of the exam period. The exact date of the take home exam will be arranged during the later part of November, since scheduled exams will be known at that time. Students in Statistics 450 will have a different take home question than students in Statistics 550.

Grading :

Assignments	40
Written Exam	30
Takehome Exam	30

- Formal notices : The following is a general statement for all courses at the University. Plagiarism is a serious Scholastic Offence. Plagiarism: Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).

If students work together on an assignment they should indicate so on their handed in work. If this is not done and there are indications of joint work the grade will apportioned accordingly.

- Formal notice 2 : Prerequisite for SS4657a: A minimum mark of 60
- Formal notice 3 :

"If a student is unable to meet a course requirement due to illness or other serious circumstances, the student must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact his or her instructor immediately. It is the student's responsibility to make alternative arrangements with his or her instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see: <http://www.uwo.ca/univsec/handbook/appeals/medical.pdf>

A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility. The form can be found here:

https://studentservices.uwo.ca/secure/medical_document.pdf

Or, request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services."