Advanced Probability 2018/2019

Statistical Science 9657A Section 001

Course Outline

Instructor Information

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Office Hours  TBA

Course Information

Course Description The course studies various modes of convergence such as convergence in (i) distribution, (ii) probability, (iii) almost sure and (iv) $L_p$. Some relations and counter examples are discussed. Strong and weak laws of large numbers and the central limit theorem are studied and proved. Sigma fields and conditional expectation are also studied. Some tools needed to apply convergence in various statistical settings are discussed, such as Slutsky's Theorem and the Cramer-Wold device. The course is a non-measure theoretic introduction to these concepts.

Pre,Co-requisites Warning 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. You can be deregistered at any time even after writing the final exam. 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.

Lecture Hours      TBA

Book Information

Text Book(s) Probability and Random Processes by G.R. Grimmett and D.R. Stirzaker, 3rd

Course Objectives The principle topic for this course is a study of convergence in distribution, and related notions. These are motivated by statistical applications, in particular asymptotic methods in statistics. The course will be mainly concerned with Chapters 1, 2, 4, 5 and 7.

This course is not a measure theoretic course in probability. All of the material can be discussed without measure theory.

Assessment

Assignments and/or Quizzes There will be 5 assignments, given out approximately two weeks each.
Midterms or Tests
There is two-hour midterm in October.

Final Exam
The final exam will consist of a three hour exam.

The final exam date and location: TBA.

Evaluation
The grading for the course will be 20% assignments + 30% midterm+ 50% final exam.

Department Policy on Missed Course Requirements and Student Health and Wellness
If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to your Dean's office as soon as possible, and contact your instructor immediately. If accommodation is approved by your Dean's office, your instructor will be notified, then it is your responsibility to make alternative arrangements with your instructor. 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://fisher.stats.uwo.ca/accommodation_medical.pdf](http://fisher.stats.uwo.ca/accommodation_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 at: [http://fisher.stats.uwo.ca/medicalform.pdf](http://fisher.stats.uwo.ca/medicalform.pdf). Or, request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services.

Missed Midterm or Test: The policy of the department of Statistical and Actuarial Sciences is that there will be no make-up exams for a missed midterm. For those that do legitimately miss a midterm and provide the required supporting documentation, the standard practice will be that the weight of the midterm will be reassigned to the final exam. If your reason is not deemed valid, then you will receive a mark of 0.

Student Health and Wellness: As part of a successful student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western's Campus Recreation Centre. Numerous cultural events are offered throughout the year. Please check out the Faculty of Music web page [http://www.music.uwo.ca/](http://www.music.uwo.ca/), and our own McIntosh Gallery [http://www.mcintoshgallery.ca](http://www.mcintoshgallery.ca). Information regarding health- and wellness-related services available to students may be found at [http://www.health.uwo.ca/](http://www.health.uwo.ca/).

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Campus mental health resources may be found at [http://www.health.uwo.ca/mental_health/resources.html](http://www.health.uwo.ca/mental_health/resources.html).

To help you learn more about mental health, Western has developed an interactive mental health learning module, found here: [https://www.uwo.ca/health/mental_wellbeing/education/module.html](https://www.uwo.ca/health/mental_wellbeing/education/module.html). This module is 30 minutes in length and provides participants with a basic understanding of mental health issues and of available campus and community resources. Topics include stress, anxiety, depression, suicide and eating disorders. After successful completion of the module, participants receive a certificate confirming their participation.

Accessibility: Please contact the course instructor if you require lecture or printed material in an
alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 ext. 82147 if you have questions regarding accommodation.

**Support Services:** Learning-skills counsellors at the Student Development Centre (SDC) ([http://www.sdc.uwo.ca](http://www.sdc.uwo.ca)) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling. Additional student-run support services are offered by the USC, [http://westernusc.ca/services](http://westernusc.ca/services). The website for Registrarial Services is [http://www.registrar.uwo.ca](http://www.registrar.uwo.ca).

**Email Communication**

You are welcome to communicate with your instructor by email, but email communication should only be used to provide them with information or to ask a question that requires a brief response. For more lengthy discussions and for discussions on lectures/course material please see your instructor during their scheduled office hours or by appointment. If you do email them, please use your UWO account, as these are often the only emails read (as emails sent from other addresses often get spammed).

**Attendance**

Classroom attendance is viewed as an important part of the learning process. Students are advised that excessive absenteeism may result in the student being disbarred from the final exam (see Western Academic Calendar).

**Classroom Environment**

The Department has adopted a "Mutual Expectations" policy governing the classroom environment and all work submitted by students. The full text of the policy can be found at: [http://www.stats.uwo.ca/mutual_expectations.pdf](http://www.stats.uwo.ca/mutual_expectations.pdf). In summary, the policy was developed under the premise that all interactions between students and faculty should be governed by the principles of courtesy, respect and honesty.