

Stor 831: Advanced Probability Fall, 2013

Place and Time: Hanes 125; Monday and Wednesday, 11:00AM-12:15PM. There will be a few times during the semester when I will ask to move a Monday class to Friday, same place and time.

Instructor: Vladas Pipiras; office: Hanes 305; e-mail: pipiras@email.unc.edu; phone: 843-2430; office hours: Tuesday 9:00AM-12:00PM. If contacting me by e-mail, please start the Subject line with "Stor 831:", e.g. Subject: Stor 831: Homework 2.

Homework: Homework will be assigned regularly, usually on Wednesday and due the following Wednesday. Each HW will be graded as: Poor, Good or Excellent.

Grades: At least 50 % of the HWs earning a grade of Good or better will earn a grade of P or better. 100% of HWs earning a grade of Good or better and at least 50% earning an Excellent will be an H.

Course website: The course website is at <http://sakai.unc.edu>. Homework assignments, lectures notes, announcements and other information will be posted there.

Prerequisite: Probability and statistics background at the graduate level; some topology, analysis and functional analysis background.

Syllabus: The course will be devoted to several forms of weak convergence (convergence in distribution) and applications. The convergence in distribution is that of random maps taking values in a metric space. The first part of the course will concern the classical theory when the metric space is separable and complete, and random maps are measurable (that is, random elements). I will somewhat follow the classical textbook:

Convergence of Probability Measures by P. Billingsley (1968, 1st edition; 1999, 2nd edition)

The applications will be those to the convergence of stochastic processes in spaces C and D . The second part of the course will concern the case when the metric space is not separable and random maps are not measurable. Here, I will mostly draw from the textbook:

Weak Convergence and Empirical Processes: with Applications to Statistics by A. W. van der Vaart and J. A. Wellner (1996)

In applications, the focus will be on empirical processes and some of their statistical applications. The two (or three) textbooks will be placed on reserve in the undergraduate library.