

Course Description
Fall 2010

Course Number: Stat 991, Section 302

Course Title: Advanced Topics in Statistics

Time and place: Tue and Thurs 1:30 – 3;

First meeting on Tuesday, Sept 14. (No meeting on Thurs, Sept 9.)

JMHH F-94

Coordinating Instructor: L. Brown

Lecturers:

D. Yekutieli (Tel Aviv University)
Sept 9 – (approx) Oct 21

C. Robert (Ceremade - Université Paris-Dauphine)
Oct 25 – Nov 2

(Note: Current plans, subject to modification, are for Chris to deliver 4 lectures during this period, in coordination with Prof. Zhao's course on Bayesian Analysis which meets M-W at 1:30.)

B. Hansen (U Michigan)
Nov 9 – Dec 9

Special Notes:

This is one of the two Advanced Topics (Stat 991) courses being offered this semester. These are two completely separate courses. Students may register for either or both of these courses.

Auditors are welcome to attend any portion of the course, but it is advisable to check with L. Brown for times and topics for individual lectures in case there may be alterations to the previously announced schedule.

Students registered for the course will be expected to attend regularly and attentively. There may also be some assigned homework to aid in understanding material covered in the lectures.

See next page for descriptions of the topics to be covered.

Lecture Topics:

Segment #1: D. Yekutieli

Title: Simultaneous and Selective inference

Abstract:

I will review key concepts in multiple comparison methodology, trying to explain the rationale for applying the different multiple comparison procedures and controlling the various error rates with the observation that multiple comparison procedures are applied for two related but distinct purposes: providing simultaneous inferences for multi-variate parameters and taking into account that the parameters of interest were selected after viewing the data.

Special Note: Prof Yekutieli will be teaching a separate Stat 991 course in the spring semester. The material covered in that course is complementary with the present lectures, and there will be only a minimal overlap with the present set of lectures.

Segment #2: C. Robert

Title: Likelihood-free computational methods

[Currently, I don't have a text description for these lectures. But I expect they will include material from one or both of the following papers that present a modern Markov Chain Monte Carlo approach:

- Beaumont, M., Robert, C.P., Marin, J.-M. and Cornuet, J.M. Adaptivity for ABC algorithms: the ABC-PMC scheme. *Biometrika* 96(4), 983-990. Available as [arXiv:08052256](https://arxiv.org/abs/08052256)
- Cornuet, J.M., Marin, J.-M., Mira, A. and Robert, C.P. Adaptive Multiple Importance Sampling, available as [arXiv:0907.1254](https://arxiv.org/abs/0907.1254)]

Segment #3: Ben Hansen

Title: What the data have to say and how strongly they say it: intervention effects via potential outcome modeling, propensity score matching and randomization inference

Topics: Fisher's, Neyman's and Rubin's uses of counterfactual or potential outcome models in the analysis of randomized experiments and observational studies; modes of inference for treatment effects associated with Fisher, Neyman and Rubin; propensity scores, matching and associated diagnostics, including current developments and controversies; intermediate outcomes from the Neyman-Rubin perspective, including instrumental variables and principal stratification; sensitivity analysis in the styles of Cornfield, Rosenbaum and others.