PSC 506

Advanced Topics in Methods

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PREREQUISITES

Students must have taken PSC 404, 405, and 505. Students who would like to waive these courses based on a different set of courses must have those courses approved by me.

COURSE REQUIREMENTS

- **Participation and Weekly Assignments (50%).** Students will be responsible for having done the required readings each week and for participating in the discussions. Applied or theoretical exercises will be assigned each week based on the required readings. Students will be expected to have completed the assignment and should be prepared to present their results in class.

- **Final Paper (50%).** A final paper due during the final period determined by the University.

COURSE SCHEDULE AND READINGS

Below are the topics we will cover this semester. The ordering reflects the sequence of topics, but not necessarily the actual weeks in which we will be covering the topics. Readings, usually articles, will be assigned week-by-week to facilitate matching articles to the level of the group. Articles will generally be available from the course web site (`http://www.rochester.edu/College/PSC/clarke/404/404.html`). You may want to find, in the library or elsewhere, a modern econometrics text that provides an introduction to these topics. Students will use the R programming language for much of this course. As such, you may want to purchase or find access to the following texts on R:

Dalgaard, Peter. *Introductory Statistics with R.* Springer.
Fox, John. *An R and S Plus Companion to Applied Regression.* Sage.
Venables, W.N. and B.D. Ripley. *Modern Applied Statistics with S.* 4th edition. Springer.

- Nonparametric smoothing/regression

- Matching and propensity scores

- The Neyman-Rubin model

- Hierarchical linear modelling

- Generalized methods of moments

- Useful tools: EM algorithm, Gibbs sampler, MCMC

- Bootstrap methods

- Simulation based estimation

- Data mining

- Model selection

- Missing data and imputation

- Student choice