

ECO 2403S: APPLIED NONPARAMETRIC AND SEMIPARAMETRIC METHODS

EVALUATION:

Paper 50%; Assignments 25%; Exam 25% Exam period. We are asked to remind you that plagiarism is a **serious** academic offence with potentially serious penalties.

Paper structure -- I. Introduction -- including brief literature review, II. Model and Data -- description of model, data, tests that are to be performed, III. Empirical Results , IV. Conclusions. References must be included. **Outline** -- one page, must contain preliminary model, key references (be sure to do a citation search), anticipated results and actual numerical data on first observation.

PREPARATION: Eco 2400F, Eco 2401S, basic probability theory and statistics, matrix algebra and calculus.

MAIN REFERENCES:

Yatchew, Adonis *Semiparametric Regression for the Applied Econometrician*, 213 pages, Themes in Modern Econometrics, Cambridge University Press.

ADDITIONAL REFERENCES:

Härdle, Wolfgang, *Applied Nonparametric Regression*, Cambridge University Press, 1990.

Pagan, Adrian and Aman Ullah, *Nonparametric Econometrics*, Cambridge University Press, 1999.

Date	Subject Matter	References
Lectures 1, 2, 3	<p style="text-align: center;">Introduction to nonparametric estimation.</p> <p>Estimators - kernel, nearest neighbour, nonparametric least squares, local polynomial; confidence intervals, rates of convergence, partial linear model, selection of smoothing parameter, specification tests</p> <p>Applications: scale economies in electricity distribution, gasoline demand, Engel curves</p>	<p>Yatchew, A. (2003) Chapters 1-3 Yatchew, A. (1998) "Nonparametric Regression Techniques in Economics", <i>Journal of Economic Literature</i>, 669-721 Härdle, W. (1990) Chapters 1-5 Blundell, R. and A. Duncan (1998): "Kernel Regression in Empirical Microeconomics", <i>Journal of Human Resources</i>, 33, 62-87.</p>
Lectures 4,5	<p style="text-align: center;">Differencing Methods</p> <p>differencing as nearest neighbour estimation, specification tests, partial linear model, testing equality of regression functions, partial parametric model, heteroskedasticity and autocorrelation covariance matrix estimation, IV estimation - endogenous parametric and nonparametric variables</p> <p>Applications: generalization of Cobb-Douglas, translog and CES cost functions, weather and electricity demand</p>	<p>Yatchew, A. (2003) Chapter 4 Robinson, P.M. (1988): "Root_N_Consistent Semiparametric Regression", <i>Econometrica</i>, 56, 931_954.</p>
Lecture 6	<p style="text-align: center;">Nonparametric Functions of Several Variables</p> <p>kernel and local polynomial methods</p> <p>Applications: hedonic pricing of housing attributes, demand for gasoline</p>	<p>Yatchew, A. (2003) Chapter 5</p>
Lectures 7, 8, 9	<p style="text-align: center;">Constrained Estimation and Hypothesis Testing</p> <p>estimation subject to constraints; tests where the null is parametric or semiparametric and the alternative is semiparametric or nonparametric</p> <p>Applications: option pricing</p>	<p>Yatchew, A. (2003) Chapter 6 Fan, Y. and Q. Li (1996): "Consistent Model Specification Tests: Omitted Variables and Semiparametric Functional Forms", <i>Econometrica</i>, 64, 865-890.</p>

<p>Lectures 10,11</p>	<p style="text-align: center;">Semiparametric Models:</p> <p>Index models, average derivative estimation, partial linear index models.</p> <p>Applications: equivalence scale estimation.</p>	<p>Yatchew, A. (2003) Ch. 7 Stoker T. (1992): <i>Lectures on Semiparametric Statistics</i>, CORE, Louvain-la-Neuve (Belgium). Carroll R.J., J. Fan, I. Gijbels and M.P. Wand (1997): "Generalized Partially Linear Single Index Models", <i>Journal of the American Statistical Association</i>, 92, 477-89. Deaton, A. (1997): <i>The Analysis of Household Surveys</i>, John Hopkins University Press. Powell, James L.(1994), "Estimation of Semiparametric Models", in the <i>Handbook of Econometrics, Vol. IV</i>, R. Engle and D. McFadden, eds., North Holland, 2444-2523.</p>
<p>Lectures 12, 13</p>	<p style="text-align: center;">Bootstrap Methods</p> <p>bootstrap confidence intervals and hypothesis testing: kernel regression, partial linear model, index models, testing of nonparametric constraints</p> <p>Applications: scale economies in electricity distribution, gasoline demand, Engel curves, option pricing,</p>	<p>Yatchew, A. (2003) Ch. 8</p>