School of Economics

Academic Year 2019-20
Term 1

COURSE CODE & COURSE TITLE: ECON713 Nonparametric Econometrics

Instructor: Lee Kong Chian Professor Liangjun SU
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Lecture time/Venue: Mondays, 3:30-6:45pm

Lesson	Date	Lesson	Date
1	20 Aug	4	10 Sept
2	27 Aug	5	17 Sept
3	3 Sept	6	24 Sept

COURSE DESCRIPTION:

This course serves a brief introduction to nonparametric econometrics that becomes standard in modern econometrics. During the 6-week course period, we will mainly focus on kernel-based nonparametric estimation and inference. This includes nonparametric kernel density estimation, tests associated with densities, nonparametric kernel regression, tests for correct specification of functional forms, nonparametric sieve estimation, and semiparametric estimation of single-equation models (including partially linear models, single-index models, additive models, etc.). If time permits, we will also briefly discuss nonparametric/ semiparametric estimation of panel data models.

PRE-REQUISITE/CO-REQUISITE/MUTUALLY EXCLUSIVE COURSE(S)

Econ 611

ASSESSMENT METHODS

Assignments   :   50 %
Project   :   50 %
Total   :   100 %

CLASS TIMINGS

Student is required to attend 1 session of lecture every week over the first half of the term. Each lecture lasts for three hours.

6 lessons * 3 hours = 18 hours in total.

RECOMMENDED TEXT AND READINGS (OPTIONAL)

1. *Nonparametric Econometrics: Theory and Practice (Highly recommended),* by Qi Li and Jeffrey Scott Racine, Princeton University Press, 2007.

2. *Nonparametric Econometrics (Optional)*, by Adrian Pagan and Aman Ullah, Cambridge University Press, 1999. This book is not just a cook book for applied people. It covers both theoretical foundations of nonparametric econometrics and empirical applications. The appendix is very helpful for you to grasp the core of the theoretical part.

3. *Nonlinear Time Series: Nonparametric and Parametric Methods (Optional)*, by Jianqing Fan and Qiwei Yao, Springer, 2003. Excellent advanced book for nonlinear time series with both parametric and nonparametric treatments.

My lecture note will be made available in eLearn.

Tentative Schedule

1. Nonparametric density estimation and testing
    a. Univariate density estimation
    b. Multivariate density estimation
    c. Testing hypotheses about densities
    d. Introduction to Matlab
2. Nonparametric regression
    a. Local constant kernel estimation
    b. Local linear/polynomial estimation
    c. Nonparametric model specification tests
3. Nonparametric sieve estimation
    a. Functional classes and sieve spaces
    b. Sieve estimation of regression functions
    c. General sieve extreme estimation
    d. Sieve estimation of density functions
4. Semiparametric estimation of partially linear models
    a. Estimation of the parametric component (Robinson, Li's estimators)
    b. Estimation of the nonparametric component
    c. Andrews' MINPIN method
    d. Specification test of partially linear models
5. Semiparametric estimation of additive models
    a. Backfitting algorithm
    b. Marginal integration method
    c. Additive partially linear models