

统计学研究专题之三

课程编号：02817100

授课对象：研究生

学 分： 2

任课教师：宋晓军

课程类型：选修

开课学期：2014 秋

先修课程：计量经济学和统计学

任课教师联系方式: sxj@gsm.pku.edu.cn

辅导、答疑时间: TBA

一、项目培养目标

学习目标 1 系统掌握从事学术研究所需要的专业知识及理论。

具体目标 1、系统掌握本学科基础知识及基本理论

具体目标 2、掌握本学科前沿知识和理论、具有足够的相关领域的知识

具体目标 3、熟练掌握本学科的研究方法

学习目标 2 具有从事创新性研究的能力；能够撰写并发表高质量的毕业论文和学术论文

具体目标 1、撰写高质量的毕业论文和学术论文

具体目标 2、具有高水平的分析能力和批判思维能力，能够创造性地解决问题

学习目标 3 具有宽阔的国际视野，能够与国际学者进行交流、合作的能力。

具体目标 1、具有优秀的口头交流和文字交流能力

具体目标 2、能够熟练地运用至少一门外语进行学术交流与沟通

学习目标 4 了解学术伦理，具有强烈的社会责任感、关注社会问题

具体目标 1、了解社会责任感的重要性

具体目标 2、了解学术生涯中的学术道德问题

具体目标 3、关注现实社会问题

二、课程概述

This course will introduce you to flexible statistical methods for the analysis of economic data, namely nonparametric and semiparametric methods in econometrics and statistics.

三、课程目标（包括学生所提高的技能要求），本课程目标如何服务于项目的培养目标

The main things you will learn in this course are how the nonparametric and/or semiparametric methods work, their usage, and their properties. We will also cover resampling methods and quantile regression.

四、内容提要及学时分配

0. **Introduction to nonparametrics (week 1):**

What is nonparametric estimation?

Interest, main features and some simple methods

1. **Density Estimation (week 2-3):**

CDF estimation

Kernel estimator

Choice of bandwidth

Other aspects: kernel choice, boundary effect

Multivariate density: curse of dimensionality

2. **Regression Estimation (week 4-5):**

Kernel estimator: properties

Choice of bandwidth

Local polynomial estimator

Other methods: series estimators, smoothing splines

3. **Bootstrap (week 6-7):**

Naïve bootstrap: confidence interval and test

Residual bootstrap for parametric regression models

Bootstrap for NP density and regression

4. **Specification Testing of Regression Models (week 8-9):**

Differencing test

Smooth test: Zheng's test

Non-smooth test: Bierens' ICM test

5. **Semiparametric Models (week 10-11):**

Partially linear model

Single-index model

Additive model

6. **Quantile Regression (week 12, if time permits):**

Estimation of quantile function: conditional and unconditional

Inference for quantile restrictions

五、教学方式

I will provide slides and notes for the students. Active interaction between students and the instructor during the class is a necessary part of this course.

六、教学过程中 IT 工具等技术手段的应用

Projector and computer installed with basic econometric softwares.

七、教材

There is no required textbook. A list of references and recommended readings will be given during the lectures. A popular book about the usage of nonparametric methods in econometrics is:

Li, Q. and Racine, J. (2006) "Nonparametric Econometrics" (Princeton University Press)

八、参考书目

Silverman, B. W. (1986) "Density Estimation for Statistics and Data Analysis" (Chapman & Hall/CRC)

Fan, J. and Gijbels, I. (1996) "Local Polynomial Modelling and Its Applications" (Chapman & Hall/CRC)

Pagan, A. and Ullah, A. (1999) "Nonparametric Econometrics" (Cambridge University Press)

Horowitz, J.L. (2009) "Semiparametric and Nonparametric Methods in Econometrics" (Springer)

九、教学辅助材料，如 CD、录影等

Not necessary until now.

十、课程学习要求及课堂纪律规范

Students who are interested in this course should be motivated and focused during the course.

The course also encourages interaction between the instructor and the students.

十一、学生成绩评定办法（需详细说明评估学生学习效果的方法）

There will be regular assignments (50%) and a final exam (50%):

90% - 100% Grade A+

80% - 90% Grade A

70% - 79% Grade B

60% - 69% Grade C

0% - 59% Fail