Term Information

Effective Term	Autumn 2019

General Information

Course Bulletin Listing/Subject Area	Economics
Fiscal Unit/Academic Org	Economics - D0722
College/Academic Group	Arts and Sciences
Level/Career	Graduate
Course Number/Catalog	8874
Course Title	Computational Econometric Methods in Applied Microeconomics
Transcript Abbreviation	Empirical IO
Course Description	This course covers computational methods used in applied microeconomic research, with particular focus on applications to the estimation and analysis of structural discrete choice models used in the study of empirical industrial organization.
Semester Credit Hours/Units	Fixed: 3

Offering Information

Length Of Course	14 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	No
Grading Basis	Letter Grade
Repeatable	No
Course Components	Lecture
Grade Roster Component	Lecture
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites	Econ 8711 and 8731
Exclusions	
Electronically Enforced	Yes

Cross-Listings

Cross-Listings	

Subject/CIP Code

Subject/CIP Code	45.0601
Subsidy Level	Doctoral Course
Intended Rank	Doctoral

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Students should obtain an understanding of the challenges faced by economists in numerical estimation and their solutions. They should develop the skills necessary to handle computational challenges beyond the scope of those covered in the course

Content Topic List

- Numerical Optimization, Differentiation, and Integration, Estimation Methods, Static Discrete Choice with Individual Level Data, Multinomial Logit and Nested Logit with MarketLevel Data, Random Coefficients Logit, Dynamic Discrete Choice

Sought Concurrence

No

Attachments

- Econ8194Sp18_Syllabus_CompMethods (002) (1).pdf

(Syllabus. Owner: Tobin,Ricky Mase)

Comments

- This course was previously offered as Econ 8194 (class #32244) *(by Tobin,Ricky Mase on 12/18/2018 01:08 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Tobin,Ricky Mase	12/18/2018 01:08 PM	Submitted for Approval
Approved	Logan,Trevon D'Marcus	12/18/2018 01:14 PM	Unit Approval
Approved	Haddad,Deborah Moore	12/18/2018 01:21 PM	College Approval
Pending Approval	Nolen,Dawn Vankeerbergen,Bernadette Chantal Oldroyd,Shelby Quinn Hanlin,Deborah Kay Jenkins,Mary Ellen Bigler	12/18/2018 01:21 PM	ASCCAO Approval

The Ohio State University
Department of Economics

Adam Dearing
Spring 2018

Economics 8194: Computational Econometric Methods in Applied Microeconomics

Prof. Adam Dearing
Arps Hall 401
Email: dearing.30@osu.edu
Office Hours: TBA and by appointment
Lecture Times: TBA
Location: TBA

Course Description:

This course covers computational methods used in applied microeconomic research, with particular focus on applications to the estimation and analysis of structural discrete choice models used in the study of empirical industrial organization. The primary goal of the course is for students to develop an understanding of the "nuts and bolts" of computational econometrics and modelling. All computational analyses will be done in Matlab. The course begins with an overview of the challenges faced by economists in estimation and simulation. We then study numerical techniques for optimization, differentiation, and integration. Next, we review econometric estimation methods and their asymptotic properties. We then move on to static models of discrete choice and individual-level data. The next major topics are discrete choice models with market-level data. The multinomial logit, nested logit, and (simplified) random coefficients logit are covered. Within these models, we discuss estimation of demand and supply, along with simulations of equilibria. The remaining weeks conclude with discussions of dynamic programming, dynamic discrete choice, and other applications.

By the end of this course, students should obtain an understanding of the challenges faced by economists in numerical estimation and their solutions. They should develop the skills necessary to handle computational challenges beyond the scope of those covered in the course itself.

Credit Hours: 3 units

Prerequisites: 8711 and 8731 or Instructor Permission. Recommended: 8871 or 8872, basic proficiency in Matlab.

Course Requirements: Students are expected to read designated readings prior to class and be prepared to discuss them during class. Problem sets will be assigned during the semester

that will focus extensively empirical analysis. Students will also be expected to give a short presentation on an assigned article.

Grading: There are **no exams** for this course. Grading is based on problem sets and in-class participation.

80% Problem Sets (8 problem sets, equally weighted)
20% In-Class Presentation

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/resource_csc.asp).

Textbooks and Resources:

Required: Train, Kenneth, *Discrete Choice Methods with Simulation*, second edition, Cambridge University Press, 2009. Available for free online at http://elsa.berkeley.edu/books/choice2.html

Optional: Judd, Kenneth, *Numerical Methods in Economics*, The MIT Press, 1998.

Javier Donna has compiled several resources on his website, which include links to the student edition of Matlab and a basic Matlab tutorial. Link: http://www.jdonna.org/resources.

Weekly Schedules:

Week 1: Introduction to Estimation and Introduction to Matlab

Train: Chapter 1

Weeks 2 and 3: Numerical Optimization, Differentiation, and Integration

Train: Chapters 8 and 9

Week 4: Estimation Methods

Train: Chapters 10 and 13

Week 5: Static Discrete Choice with Individual-Level Data

Train: Chapters 3 and 5

Week 6: Multinomial Logit and Nested Logit with Market-Level Data

Train: Chapters 4 and 6

Berry, 1994, "Estimating Discrete-Choice Models of Product Differentiation," RAND Journal of Economics.

Li and Huh, 2011, "Pricing Multiple Products with the Multinomial Logit and Nested Logit Models: Concavity and Implications," Manufacturing & Service Operations Management.

Weeks 7, 8, and 9: Random Coefficients Logit: Demand, Supply, and Equilibrium

Berry, Levinsohn, and Pakes, 1995, "Automobile Prices in Market Equilibrium," Econometrica.

Nevo, 2000, "A Practitioner's Guide to Estimation of Random Coefficients Logit Models of Demand," Journal of Economics & Management Strategy.

Dubé, Fox, and Su, 2011, "Improving the Numerical Performance of BLP Static and Dynamic Discrete Choice Random Coefficients Demand Estimation," Econometrica.

Lee, "A New Computational Algorithm for Random Coefficients Model with Aggregate-Level Data," Working Paper, UCLA.

Morrow and Skerlos, 2011, "Fixed-Point Approaches to Computing Bertrand-Nash Equilibrium Prices Under Mixed-Logit Demand," Operations Research.

Aksoy-Pierson, Allon, and Federgruen, 2013, "Price Competition under Mixed Multinomial Logit Demand Functions," Management Science.

Weeks 10, 11, and 12: Dynamic Discrete Choice

Gowrisankaran and Rysman, 2012, "Dynamics of Consumer Demand for New Durable Goods," Journal of the Political Economy.

Aguirregabiria and Mira, 2007, "Sequential Estimation of Dynamic Discrete Games," Econometrica.

Hotz and Miller, 1993, "Conditional Choice Probabilities and the Estimation of Dynamic Models," Review of Economic Studies.

Weeks 13 and 14: Student Presentations and Other Applications

TBD

Disability Services: Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; http://www.ods.ohio-state.edu/