

The Ohio State University
Colleges of the Arts and Sciences New Course Request

Economics

Academic Unit

ECON

Book 3 Listing (e.g., Portuguese)

841 Advanced Econometrics I

Number Title

Adv Econometrics I

G

05

18-Character Title Abbreviation

Level

Credit Hours

Summer

Autumn

Winter

X

Spring

Year

2007

Proposed effective date, choose one quarter and put an "X" after it; and fill in the year. See the OAA curriculum manual for deadlines.

A. Course Offerings Bulletin Information

Follow the instructions in the OAA curriculum manual. If this is a course with decimal subdivisions, then use one New Course Request form for the generic information that will apply to all subdivisions; and use separate forms for each new decimal subdivision, including on each form the information that is unique to that subdivision. If the course offered is less than a quarter or a term, please complete the Flexibly Scheduled/Off Campus/Workshop Request form.

Description (*not to exceed 25 words*): This course covers selected advance topics in econometrics such as non parametric and semiparametric estimation, numerical optimization, Markov chain Monte Carlo methods, and duration models, which are used in economics.

Quarter offered: Spring

Distribution of class time/contact hours: 2-2 hr cl

Quarter and contact/class time hours information should be omitted from Book 3 publication (yes or no):

Prerequisite(s): Economics 742 or equivalent with instructor's consent

Exclusion or limiting clause:

Repeatable to a maximum of 10 credit hours.

Cross-listed with: NA

Grade Option (Please check): Letter S/U Progress What course is last in the series? _____

Honors Statement:

Yes No

GEC:

Yes No

Admission Condition

Off-Campus:

Yes No

EM:

Yes No

Course: Yes No

Other General Course Information:

(e.g. "Taught in English." "Credit does not count toward BSBA degree.")

B. General Information

Subject Code 450601 Subsidy Level (V, G, T, B, M, D, or P) D

If you have questions, please email Jed Dickhaut at dickhaut.1@osu.edu.

1. Provide the rationale for proposing this course: The main focus of this course is on nonparametric and semiparametric estimation and related topics. The objective is to enhance the understanding of the workings of these estimation procedures in the context of economic analysis and to provide theoretical justifications. Students should be able to commence on research in applied econometrics and to appreciate research articles in econometrics theory.

2. Please list Majors/Minors affected by the creation of this new course. Attach revisions of all affected programs.
 This course is (check one): Required on major(s)/minor(s) A choice on major(s)/minors(s)
 An elective within major(s)/minor(s) A general elective:

3. Indicate the nature of the program adjustments, new funding, and/or withdrawals that make possible the implementation of this new course.
 N/A

4. Is the approval of this request contingent upon the approval of other course requests or curricular requests?

Yes No List:

5. If this course is part of a sequence, list the number of the other course(s) in the sequence:

6. Expected section size: 25 Proposed number of sections per year: 1

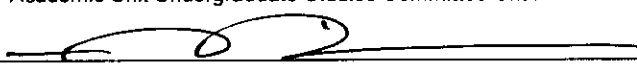

7. Do you want prerequisites enforced electronically (see OAA manual for what can be enforced)? Yes No

8. This course has been discussed with and has the concurrence of the following academic units needing this course or with academic units having directly related interests (*List units and attach letters and/or forms*):

Concurrence pending from Department of Statistics, Department of Agricultural, Environmental and Development Economics, and Department of Finance

9. Attach a course syllabus that includes a topical outline of the course, student learning outcomes and/or course objectives, off-campus field experience, methods of evaluation, and other items as stated in the OAA curriculum manual and e-mail to asccurrofc@osu.edu.

Approval Process The signatures on the lines in ALL CAPS (e.g. ACADEMIC UNIT) are required.

1. Academic Unit Undergraduate Studies Committee Chair	Printed Name	Date
	Hajime MIYAZAKI	11/9/2006
2. Academic Unit Graduate Studies Committee Chair	Printed Name	Date
	Masanori HASHIMOTO	11/9/2006
3. ACADEMIC UNIT CHAIR/DIRECTOR	Printed Name	Date
4. After the Academic Unit Chair/Director signs the request, forward the form to the ASC Curriculum Office, 105 Brown Hall, 190 West 17 th Ave. or fax it to 688-5678. Attach the syllabus and any supporting documentation in an e-mail to asccurrofc@osu.edu . The ASC Curriculum Office will forward the request to the appropriate committee.		
5. COLLEGE CURRICULUM COMMITTEE	Printed Name	Date
6. ARTS AND SCIENCES EXECUTIVE DEAN	Printed Name	Date
7. Graduate School (if appropriate)	Printed Name	Date
8. University Honors Center (if appropriate)	Printed Name	Date
9. Office of International Education (if appropriate)	Printed Name	Date
10. ACADEMIC AFFAIRS	Printed Name	Date

**The Ohio State University
Colleges of the Arts and Sciences Concurrence Form**

The purpose of this form is to provide a simple system of obtaining departmental reactions to course requests. A letter may be substituted for this form.

An academic unit initiating a request should complete Section A of this form and send a copy of the form, course request, and syllabus to each of the academic units that might have related interests in the course. Initiating units should be allowed two weeks for responses.

Academic units receiving this form should respond to Section B and return the form to the initiating unit. Overlap of course content and other problems should be resolved by the academic units before this form and all other accompanying documentation may be forwarded to the Office of Academic Affairs.

A. Information from the academic unit *initiating* the request

Economics November 9, 2006

 Initiating Academic Unit Date

ECON

 Book 3 Listing (e.g., Portuguese)

841	Advanced Econometrics I	G	05
Course Number	Title	Level	Credit Hours

Type of Request: New Course Course Change Course Withdrawal Other

Department of Agricultural, Environmental and Development Economics

 Academic unit asked to review the request

November 30, 2006


 Date response is needed (within two weeks of above date)

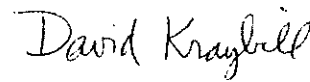
B. Information from the academic unit *reviewing* the request should include a reaction to the proposal, including a statement of support or non-support (continued on the back of this form or a separate sheet, if necessary).

This proposal revises and updates in the first course in the ECON PhD field in econometrics. It will benefit the relatively few AEDE students seeking the econometrics field, and provide us a recruiting advantage among students who are interested in having this option.

AEDE is pleased to concur.

Signatures

	Chair	Agri, Environ & Development Economics	1/02/07
1. Name	Position	Unit	Date

	Grad. Studies Chair	Agri, Environ & Development Economics	1/02/07
2. Name	Position	Unit	Date

3. Name	Position	Unit	Date
---------	----------	------	------

**The Ohio State University
Colleges of the Arts and Sciences Concurrence Form**

The purpose of this form is to provide a simple system of obtaining departmental reactions to course requests. A letter may be substituted for this form.

An academic unit initiating a request should complete Section A of this form and send a copy of the form, course request, and syllabus to each of the academic units that might have related interests in the course. Initiating units should be allowed two weeks for responses.

Academic units receiving this form should respond to Section B and return the form to the initiating unit. Overlap of course content and other problems should be resolved by the academic units before this form and all other accompanying documentation may be forwarded to the Office of Academic Affairs.

A. Information from the academic unit *initiating* the request

Economics
Initiating Academic Unit

November 9, 2006
Date

ECON
Book 3 Listing (e.g., Portuguese)

841	Advanced Econometrics I	G	05
Course Number	Title	Level	Credit Hours

Type of Request: New Course Course Change Course Withdrawal Other

Department of Finance
Academic unit asked to review the request

November 30, 2006
Date response is needed (within two weeks of above date)

B. Information from the academic unit *reviewing* the request should include a reaction to the proposal, including a statement of support or non-support (continued on the back of this form or a separate sheet, if necessary).

Support granted

Signatures

1. Name	Position	Unit	Date
<i>Andrew Kennedy</i>	<i>Professor of Finance</i>		<i>1/2/07</i>
2. Name	Position	Unit	Date
<i>Amil K. Madhija</i>	<i>Chair, Dept. of Finance</i>		<i>1/2/07</i>
3. Name	Position	Unit	Date

Economics 940 Economics 841
Econometrics Seminar Advanced Econometrics I

Spring 2007
S. R. Cosslett

05 credit hours

G: course listing

Grade: Letter Grade

Repeatable to a maximum 10 credit hours

Prerequisites: Economics 742 (Econometrics II) or equivalent with instructor's consent.

Course Abstract: This course will cover selected advanced topics in econometrics, such as nonparametric and semiparametric estimation, numerical optimization, simulation methods, Markov chain Monte Carlo (MCMC) methods, and duration models.

Lectures: twice a week, each 108 minutes long:

Time and Place (TBA): tentatively Tuesday and Thursday 12:30AM-2:18PM

Instructor: Professor Stephen Cosslett

Office Hours: Mon, Wed, Thurs. 3:30–4:30 PM and by appointment.

Office: Arps Hall 455A

Phone 292-4106

Email: cosslett.1@osu.edu

Course Objectives: This course is an integral part of the econometrics field sequence leading to the second-year field exams for Ph.D. students in economics. This course can be taken concurrently or independently of Economics 840 (Time Series Econometrics), Economics 842 (Advanced Econometrics II), and can serve as a recommended course before taking Economics 843 (Research Topics in Micro Econometrics). Students should be able to commence on research in applied econometrics and to appreciate frontier research articles in econometric theory. This main focus of this course is on nonparametric and semiparametric estimation and related topics. The objective is to enhance understanding of the workings of these estimation procedures in the context of economic analysis and to provide theoretical justifications.

Course Grade: Term Paper (40%), Occasional Assignments (30%), In-class presentation (30%). Students are required to write a term paper on an econometric topic of their choice subject to the instructor's approval. The paper may be a substantial research proposal or critical survey of the literature. The term paper need not be purely theoretical or methodological, but can be an empirical study with a sufficiently rigorous econometrics content. In addition, each student must give an in-class presentation of the term paper topic (approximately 25 minutes) in the latter half of the quarter, according to the following due dates:

Provisional topic to be determined: May 2

Outline of paper (1 page): May 9

Final version of paper: June 8 (exam week)

There will be no in-class final examination, but depending on the class size, part of the occasional assignments may be substituted by in-class quizzes or a mid term exam.

Course Material:

Recommended Textbooks

- W. H. Greene, *Econometric Analysis*, 5th ed, Prentice Hall, 2003
A. Pagan and A. Ullah, *Nonparametric Econometrics*, Cambridge University Press, 1999.
T. Amemiya, *Advanced Econometrics*, Harvard University Press, 1985.

Reference textbooks for nonparametric and semiparametric estimation:

- B. W. Silverman, *Density Estimation for Statistics and Data Analysis*, Chapman and Hall, 1986.
W. Härdle, *Applied Nonparametric Regression*, Cambridge University Press, 1990.
W. Härdle and O. Linton, "Applied Nonparametric Methods" in Volume 4, *Handbook of Econometrics*

J. L. Powell, "Estimation of Semiparametric Models" in Volume 4, *Handbook of Econometrics*

Reference textbooks for asymptotic theory

- J. Davidson, *Stochastic Limit Theory*, Oxford University Press, 1994.

Additional readings and references will be announced as the class evolves.

COURSE OUTLINE

1. Nonparametric estimation and related topics (Lectures 1, 2, 3, 4)

Kernel density estimation

- Histogram, nearest-neighbor estimator, kernel estimator, adaptive kernel estimator.
Orthogonal series methods, spline-fitting methods.
Statistical properties of kernel estimators, bias reduction, multivariate density estimation.
Cross-validation methods for choosing the kernel window width.
[Pagan and Ullah, sections 2.2–2.5 and 2.7–2.8; see also Silverman, chapters 2–4, and Greene, section 16.4.1]

Nonparametric regression

- Nadaraya-Watson estimator, local linear and local polynomial regression estimators.
[Pagan and Ullah, section 3.2 — main points only; see also Greene, section 16.4.2]
Statistical properties of the Nadaraya-Watson estimator
[Pagan and Ullah, sections 3.3.1 and 3.4.1 — main points only]
Series methods for nonparametric regression (semi-nonparametric estimation)
[Pagan and Ullah, sections 3.8–3.9]

2. Semiparametric estimation — selected topics (Lectures, 5, 6, 7, 8, 9, 10, 11)

Average derivative estimators

[Pagan and Ullah, sections 4.3.3 and 4.6]

J. L. Powell, J. H. Stock, and T. H. Stoker, “Semiparametric Estimation of Index Coefficients”, *Econometrica* 57, 1403-1430, 1989

Semiparametric least squares estimator for single-index models

H. Ichimura, “Semiparametric Least Squares (SLS) and Weighted SLS Estimation of Single-Index Models,” *Journal of Econometrics* 58, 71-120, 1993.

[Pagan and Ullah apply this method to the binary choice model in section 7.4.1]

Efficiency bounds

[Pagan and Ullah, section 5.4 — main points only]

Adaptive estimation of the linear regression model

[Pagan and Ullah, section 5.5.4]

Semiparametric estimators of the binary choice model

Maximum score estimator [Pagan and Ullah, sections 7.5.1–7.5.2]

C. F. Manski, “The Maximum Score Estimation of the Stochastic Utility Model of Choice,” *Journal of Econometrics* 3, 205-228, 1975

J. L. Horowitz, “A Smoothed Maximum Score Estimator for the Binary Response Model,” *Econometrica* 60, 505-531 (1992)

Klein-Spady estimator [Pagan and Ullah, section 7.4.2]

R. W. Klein and R. H. Spady, “An Efficient Semiparametric Estimator of Binary Response Models,” *Econometrica* 61, 387-421, 1993

3. Numerical optimization methods (Lectures 12, 13)

Greene discusses several numerical optimization methods in Appendix E.6.

A useful reference is W. H. Press et al., *Numerical Recipes*, Cambridge University Press, which contains several chapters on numerical optimization. There are different editions of the book giving examples in different computer languages (such as C, C++, and Fortran), which most people won't need, but there are good explanations of how the different algorithms work.

4. Simulation methods (Lectures 14, 15, 16, 17)

Greene, Appendix E.2–E.5, gives an overview of random number generation, the Gibbs sampler, Monte Carlo studies, and bootstrapping.

Reference for bootstrap theory: J. L. Horowitz, “The Bootstrap,” in Volume 5 of the *Handbook of Econometrics*

Markov chain Monte Carlo (MCMC) simulation [Greene, section 16.2.4]

MCMC simulation is mainly (but not exclusively) used in Bayesian estimation, so we'll have a brief introduction to Bayesian econometrics [see Greene, section 16.2.2 for more details and references].

MCMC in econometrics: S. Chib and E. Greenberg, *Econometric Theory* 12, 409-431, 1996

Data augmentation: J. Albert and S. Chib, *Journal of the American Statistical Association* 88, 669-679, 1993.

Simulated moment estimation and simulated likelihood estimation

D. McFadden and P. A. Ruud, "Estimation by Simulation," *Review of Economics and Statistics* 76, 51-608, 1994.

GHK method for estimating multinomial probit.

5. Parametric models — selected topics (Lectures 18, 19, 20)

Duration-time models: Hazard rate, time-varying hazard rate, unobserved heterogeneity, right censoring, left censoring, proportional hazards model, competing risks model.

[Greene, section 22.5; Amemiya, section 11.2]

General reference: T. Lancaster, *The Econometric Analysis of Transition Data*, Cambridge University Press, 1992.

Semiparametric estimation of models with unobserved heterogeneity:

J. Heckman and B. Singer, "A Method for Minimizing the Impact of distributional Assumptions in Econometric models for Duration Data," *Econometrica* 52, 277-320, 1984.

This syllabus and other class materials are available in alternative formats upon request. Students with disabilities are responsible for making their need known to the instructor and seeking assistance in a timely manner. For more information, please contact the Office of Disability Services at 292-3307.