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

Economics
Academic Unit

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

844 Research Topics in Time Series Econometrics
Number Title

Res Time Series Econometrics 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 surveys and trains advanced Ph.D. students in economics with recent techniques and concepts in the econometric analysis of times series models

Quarter offered: WI 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, Economics 840 recommended

Exclusion or limiting clause:

Repeatable to a maximum of 15 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: Rigorous treatment of time-series analysis using recent techniques and concepts in econometrics. The course material consists of recent research topics. Since the course content will vary depending on the individual instructor's research specialization and field expertise, this course is repeatable up to three times for credit when thematic topics change.

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	10/25/2006
2.	Academic Unit Graduate Studies Committee Chair	Printed Name	Date
		Masanori HASHIMOTO	10/25/06
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 17th 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

Economics 894 (in process to Economics 844)

RESEARCH TOPICS IN TIME-SERIES ECONOMETRICS

05 credit hours
G: course listing
Grade: Letter Grade
Repeatable to a maximum 15 credit hours

Prerequisites: Economics 742 (Econometrics II) or equivalent with instructor's consent. Economics 840 (Time-Series Econometrics) is recommended but not required.

Course Abstract: Rigorous treatment of time-series analysis using recent techniques and concepts in econometrics. The course material consists of recent research topics. Since the course content will vary depending on the individual instructor's research specialization and field expertise, this course is repeatable up to three times for credit when thematic topics change. The major topics of the Winter 2007 course are nonlinearity in stationary and nonstationary time-series, cointegration, unit root processes, and their applications in economics.

Lectures: twice a week, each 108 minutes long:
Time and Place (TBA): tentatively Tuesday and Thursday 11:30AM-1:18PM

Course Topics for Winter Quarter 2007
Nonlinearity in Stationary and Nonstationary Time Series

Instructor: Professor Robert M. de Jong
Department of Economics
429 Arps Hall, 1945 N. High Street

614-292-2051 (Office) and de-jong.8@osu.edu

Office hours (TBA): tentatively Tuesday & Thursday 2:00PM-4:00pm.

Course Objectives: The purpose of this course is to present recent techniques and concepts in the econometric analysis of nonlinearity in time-series models to second-year Ph.D. students in economics. We cover both stationary and non stationary time series models. The course reviews frontier articles with rigor through a combination of lectures, discussion and student presentations. Applications are drawn from the economics fields in which time series data plays an especially important role, such as macroeconomics and international economics. The course can be divided into two parts. In the first part, we will examine the asymptotic theory of minimization estimators in a time series framework, paying particular attention to consistency and asymptotic normality results. In the second part, we will investigate the theory of cointegration and unit root processes. These theories have generated a large amount of literature in economics and have enlarged the scope of empirical

inquiry into economic policy issues in recent years, especially on macroeconomic topics such as growth and exchange rates.

Course Requirements and Evaluation: There will be five homework assignments as well as a midterm and final exam. In addition, depending on the class size, you are required to present one or two papers from items 1-9 in the list given below. The instructor may add a few papers to the list, and you may also present papers of your own choice subject to the instructor's approval. The course grade will be based on homework (20%), mid-term exam (20%), final exam (40%), and in-class presentation (20%).

Course Material: We will make recourse to recent journal articles and working papers as well as select chapters from research monographs. See the Reading List at the end of this syllabus. Several more papers may be added as the course evolves.

COURSE OUTLINE

Part I. Time Series Minimization Estimators: Consistency and Asymptotic Normality

Weeks 1, 2 and 3

1. Consistency and Asymptotic Normality of Estimators

   de Jong, R.M., "Consistency and Asymptotic Normality," *class notes* (written by instructor)

2. Uniform Law of Large Numbers and Taylor Series Argument

3. Generalization of the Argument to Time Series

   Wooldridge, J., "Estimation and Inference for Dependent Processes," Chapter 45, *Handbook of Econometrics*, 1994

Week 3, 4 and 5: Instructor-led Discussion and Student Presentation

Engle, R. and A. Smith, "Stochastic Permanent Breaks," *Review of Economics and Statistics* 81, 1999, 553-574.

Engle, R. and J. Russell, "Autoregressive Conditional Duration: A New Model for Irregularly Spaced Transaction Data," *Econometrica* 66, 1998, 1127-1162.

D. van Dijk, T. Terasvirta and P.H. Franses, "Smooth Transition Autoregressive Models - A Survey of Recent Developments," *mimeo.*, 2000.

Terasvirta, Tjostheim, and Granger, "Aspects of Modelling Nonlinear Time Series," in R. F. Engle and D. L. McFadden (eds.), *Handbook of Econometrics*, vol. IV. Amsterdam: Elsevier Science, 1994, 2917-2957.

Andrews, D., "Tests for Parameter Instability and Structural Change with Unknown Change Point," *Econometrica* 61, 1993, 821-856.

Part II. The Theory of Cointegration and Unit Root Processes

Weeks 6, and 7

1. Unit Roots, Spurious Regressions, Cointegration

   Hamilton, J., "Time Series Analysis," Princeton: Princeton University Press, 1994.

2. Local Time

   de Jong, R.M., "Local Time," *class notes* (written by instructor).

Week 8, 9 and 10: Instructor-led Discussion and Student Presentation

Sims, C., Stock, J. and M. Watson, "Inference in Linear Time Series Models with Some Unit Roots," *Econometrica* 58, 1990, 113-144.

Rossana, R.J., "The Long-Run Implications of the Production Smoothing Model of Inventories: An Empirical Test," *Journal of Applied Econometrics* 8, 1993, 295-306.

Kapetanios, Shin and Snell, "Testing for a Unit Root against Nonlinear STAR Models," forthcoming, *Journal of Econometrics*.

Park and Phillips, "Asymptotics for Nonlinear Transformations of Integrated Time Series," *Econometric Theory* 15, 1999, 269-298.

READING LIST

1. Engle, R. and A. Smith, "Stochastic Permanent Breaks," *Review of Economics and Statistics* 81, 1999, 553-574.

2. Engle, R. and J. Russell, "Autoregressive Conditional Duration: A New Model for Irregularly Spaced Transaction Data," *Econometrica* 66, 1998, 1127-1162.

3. D. van Dijk, T. Terasvirta and P.H. Franses, "Smooth Transition Autoregressive Models - A Survey of Recent Developments," *mimeo*, 2000.

4. Terasvirta, Tjostheim, and Granger, "Aspects of Modeling Nonlinear Time Series," in R. F. Engle and D. L. McFadden (eds.), *Handbook of Econometrics*, vol. IV. Amsterdam: Elsevier Science, 1994, 2917-2957.

5. Andrews, D., "Tests for Parameter Instability and Structural Change with Unknown Change Point," *Econometrica* 61, 1993, 821-856.

6. Sims, C., Stock, J. and M. Watson, "Inference in Linear Time Series Models with Some Unit Roots," *Econometrica* 58, 1990, 113-144.

7. Rossana, R.J., "The Long-Run Implications of the Production Smoothing Model of Inventories: An Empirical Test," *Journal of Applied Econometrics* 8, 1993, 295-306.

8. Kapetanios, Shin and Snell, "Testing for a Unit Root against Nonlinear STAR Models," forthcoming, *Journal of Econometrics*.

9. Park and Phillips, "Asymptotics for Nonlinear Transformations of Integrated Time Series," *Econometric Theory* 15, 1999, 269-298.

10. de Jong, R.M., "Consistency and Asymptotic Normality," *class notes* (written by instructor).

11. Wooldridge, J., "Estimation and Inference for Dependent Processes," Chapter 45, *Handbook of Econometrics*, 1994

12. Hamilton, J., "Time Series Analysis," Princeton: Princeton University Press, 1994

13. de Jong, R.M., "Local Time," *class notes* (written by instructor).

Any student who needs an accommodation based on the impact of a disability should contact the instructor as soon as possible to discuss ways to meet his or her special needs. Such students should also contact the OSU Office for Disabilities Services (292-3307).

Professor Robert M. de Jong
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