University of Wisconsin-Whitewater

Curriculum Proposal Form #3

## New Course

**Effective Term:**

**Subject Area - Course Number:** **ECON 743 Cross-listing:**

(See Note #1 below)

**Course Title:** (Limited to 65 characters) ECONOMETRICS II

**25-Character Abbreviation:** ECONOMETRICS II

**Sponsor(s):** David Welsch and Yamin Ahmad

**Department(s):** Economics

**College(s):**

# **Consultation took place**: [x]  NA [ ]  Yes (list departments and attach consultation sheet)

Departments:

**Programs Affected:** **None**

**Is paperwork complete for those programs?** (Use "Form 2" for Catalog & Academic Report updates)

[x]  NA [ ]  Yes [ ]  will be at future meeting

**Prerequisites:** ECON 733 - Econometrics I and ECON 738 - Quantiative Methods in Economics

**Grade Basis:** [x]  Conventional Letter [ ]  S/NC or Pass/Fail

**Course will be offered:** [x]  Part of Load [ ]  Above Load

 [x]  On Campus [ ]  Off Campus - Location

**College:**  **Dept/Area(s):** ECON

**Instructor:** David Welsch

 *Note: If the course is dual-listed, instructor must be a member of Grad Faculty.*

**Check if the Course is to Meet Any of the Following:**

[ ]  Technological Literacy Requirement [ ]  Writing Requirement

[ ]  Diversity [ ]  General Education Option:

Note: For the Gen Ed option, the proposal should address how this course relates to specific core courses, meets the goals of General Education in providing breadth, and incorporates scholarship in the appropriate field relating to women and gender.

**Credit/Contact Hours:** (per semester)

Total lab hours: 0 Total lecture hours: 48

Number of credits: 3 Total contact hours: 48

**Can course be taken more than once for credit? (Repeatability)**

[x]  No [ ]  Yes If "Yes", answer the following questions:

No of times in major:       No of credits in major:

No of times in degree:       No of credits in degree:

Proposal Information: ([***Procedures for form #3***](http://acadaff.uww.edu/UCC/Curriculum_Handbook_09/Procedures_form3.docx))

**Course justification:**

This proposed course will be a core course for students in the MS Economics program. The course will help to develop and advance the statistical and econometric skills of students in the program. Students will study applied methods for model selection, implementation, and inference for cross sectional, time series, and panel data. Course readings will highlight some of the techniques being covered so that, students will start to be able to familiarize themselves with utilization of these methods in preparation for conducting a thesis. Consequently this course is a necessary within the MS Economics program.

**Relationship to program assessment objectives:**

This course addresses the following learning objectives in the program: Quantitative and Statistical Proficiency and the Communication Proficiency. The specific student learning outcomes (traits) that this course will address are:

* Students are able to conduct an analysis using cross sectional data.
* Students are able to conduct an analysis using time series data.
* Students are able to communicate and convey the results of their analysis in written form.

**Budgetary impact:**

* **Staffing**:- the course will be staffed by a Economics Department faculty that is Academically Qualified (AQ) and has Grad Faculty status.
* **Academic unit library and service & supply budget:** - no budgetary impact.
* **Campus instructional resource units**:- impact is minimal; students will be required to use Stata and Matlab; There are 10 licenses of Stata available on campus computers and Matlab is available in the General Access labs in the Library and McGraw. In addition, Matlab is available in the computer labs in Hyland Hall where the course is anticipated to take place
* **Laboratory/studio facilities:**- No budgetary impact
* **Classroom space:**- A classroom is anticipated to be required in Hyland Hall to teach the class. The class will meet for 1hour 15 minute session, twice per week.
* **Evaluation of adequacy of current library holdings, recommendations for acquisitions, and impact of the course on the academic unit library allocation budget:** - No impact. The course will be taught using a graduate textbook which students will be required to obtain.
* **Explanation if the course is simply replacing another course, either entirely or in the cycle:**- This is a new course for the MS Economics degree, and does not replace any other courses.

**Course description:** (50 word limit)

Econometrics II introduces students to advanced techniques in modeling. In the course, students will study applied methods for model selection, implementation, and inference for cross sectional, time series, and panel data. The major emphasis will be on understanding these models from an intuitive perspective and estimating these using computer programs.

**If dual listed, list graduate level requirements for the following:**

1. **Content** (e.g., What are additional presentation/project requirements?)

N/A

2. **Intensity** (e.g., How are the processes and standards of evaluation different for graduates and undergraduates? )
N/A

3. **Self-Directed** (e.g., How are research expectations differ for graduates and undergraduates?)
N/A

**Course objectives and tentative course syllabus:**

**ECON 743: Econometrics II**

**Spring 2015**

**Instructors:**

Parts I and II:

David Welsch: Office - Hyland Hall 4400; Tel: x4715, Email: welschd@uww.edu; Office Hours: MW 7:30-8:30AM, 12:30-2:00PM, 3:35-4:05; Thursdays from 9:30-12:00 and by appointment

Part III:

Yamin Ahmad: Office: 4402 Hyland Hall, Tel: x5576, Email: ahmady@uww.edu; Office Hours: Walk in: MW 2:00pm – 5:00pm; Email: F 9am – 11am; and by appointment.

**Course Web Page:** <http://facstaff.uww.edu/ahmady/courses/econ743/>

This is the web page for the course. Here you can find the course schedule, lecture notes, problem sets and more.

**Prerequisites**

ECON 738 – Quantitative Methods in Economics AND

ECON 733 – Econometrics I

**Suggested Texts**

**Parts I and II:**

1. [W] Wooldridge, J.M., Introductory Econometrics: A Modern Approach, 4th edition, South Western.
2. [CT] Cameron, A. C., and Pravin K. Trivedi, Microeconomics Using Stata

**Part III:**

1. [E] Enders, W., Applied Econometric Time Series, 2nd Edition, Wiley, 2004
2. [AH] Harvey, A. C., Times Series Models, 2nd Edition, MIT Press
3. [H] Hamilton, J. D., Time Series Analysis, Princeton University Press
4. [DM] Davidson, R. and J. G. MacKinnon, Econometric Theory and Methods, Oxford University Press

**Course Description Objectives and Assessment**

This course is divided into three parts. The first part of the course reviews some of the big concepts from Econometrics I but using the language of Matrix Algebra. The second part of the course introduces students to methods and techniques used in cross sectional and panel data analysis, primarily used for microeconomic analysis. The final part of the course introduces students to time series methods and techniques, utilized by macroeconomic analysis.

Throughout the course, students will study applied methods for model selection, implementation, and inference for cross sectional, time series, and panel data. The major emphasis will be on understanding these models from an intuitive perspective and estimating these using computer programs. In addition, readings will be recommended for many of the advanced topics from both the suggested textbooks, as well as journal articles that highlight some of the techniques being covered. In this way, students will also start to be able to familiarize themselves with utilization of these methods in preparation for conducting a thesis.

**Grading Policy:** In this class we will have three exams, 5-7 homework assignments, a final, a class project, and some “pop” assignments. After many classes we will post a question on our class webpage or mention it in class, and you will be responsible for having the answer prepared before the next class. These “pop” assignments will be mostly for review, and to test your application skills, but we will randomly collect 3-5 of these and grade them. Your best two out of these will be worth 50 points of your final grade. You will not be able to make up “pop” assignments.

 **We do not give make up exams.** If you must miss an exam arrangements must be made with me prior to the exam. If arrangements are made before the exam, I will weigh the other exams to make up for the missed exam; if no arrangements are made, you will receive a zero for the exam.

**Grade Breakdown:** “Pop” Assignments (Best 2 of 3-5) 50 points

Exam 1 (mini-exam/50 minutes) 100 points

Lab Exam 100 points

 Exam 2 150 points

 Class Project 200 points

 Homework (5 best, 30 points each) 150 points

 Final Exam 250 points

**Grade distribution:** A 93-100% C 71-74.9%

A- 90-92.9% C- 68-70.9%

B+ 87-89.9% D+ 65-67.9%

B 81-86.9% D 61-64.9%

B- 78-80.9 D- 58-60.9%

 C+ 75-77.9 F Below 58

**Additional**

**Information:** If you are in need of special help in taking exams, please inform us early in the semester.

**Policy Statement**

*The University of Wisconsin-Whitewater is dedicated to a safe, supportive and non-discriminatory learning environment.  It is the responsibility of all undergraduate and graduate students to familiarize themselves with University policies regarding Special Accommodations, Misconduct, Religious Beliefs Accommodation, Discrimination and Absence for University Sponsored Events.  (For details please refer to the Undergraduate and Graduate Timetables; the “Rights and Responsibilities” section of the Undergraduate Bulletin; the Academic Requirements and Policies and the Facilities and Services sections of the Graduate Bulletin; and the “Student Academic Disciplinary Procedures” [UWS Chapter 14]; and the “Student Nonacademic Disciplinary Procedures” [UWS Chapter 17].*

**UWW Student Honor Code**

*As members of the University of Wisconsin – Whitewater College of Business & Economics community, we commit ourselves to act honestly, responsibly, and above all, with honor and integrity in all areas of campus life.  We are accountable for all that we say and write.  We are responsible for the academic integrity of our work.  We pledge that we will not misrepresent our work nor give or receive unauthorized aid.  We commit ourselves to behave in a manner that demonstrates concern for the personal dignity, rights and freedoms of all members of the community.  We are respectful of college property and the property of others.  We will not tolerate a lack of respect for these values.*

*This code originated at Wheaton College.*

Honor Code and Statement on Plagiarism.

<http://www.wheatoncollege.edu/StudentLife/honorCode/>

## Part I: Review of Econometrics I with Linear Algebra [Weeks 1 – 3]

Section 1 Review of OLS and Extension with Matrix Algebra (Week 1)

* Review of Interpretation of models
* Deriving OLS coefficients with matrix algebra, demonstration of programing in Matlab

Section 2 Review of Endogeneity, IV, 2SLS, Natural Experiments and Extension with Matrix Algebra (Week 2)

* Review of endogeneity and estimation of IV and 2SLS models in STATA
* Deriving IV and 2SLS estimators with matrix algebra
* Testing instruments
* More on Multiple instruments

Part 3 Review of Limited Dependent Variables (Week 3)

* Discrete dichotomous: Linear Probability models, probit, logit
* Multinomial Logit
* Count: Poisson and negative binomial
* Censored: Tobit
* More on distributions and how to write code to estimate these models “manually”

## Part II: Microeconometrics Panel Data and Advanced Cross Sectional Analysis [Weeks 4 – 10]

Section 4 Panel Data I (Week 4 – 5)

* Difference in Difference Models (DID)
* Lagged Dependent Models
* Pooled OLS (clustered standard errors revisited), Random Effects, and Fixed Effects Models
* Choosing between random effects, fixed effect, and lagged dependent models

Section 5 Panel Data II (Week 6)

* IV with Panel data
* Nonlinear panel data models

Section 6 Advance Cross Sectional I (Weeks 7 – 8)

* Survival analysis/ Duration models
* Quantile regression
* Stochastic frontier analysis (SFA)
* Hierarchical linear models and multiple clustered standard errors
* Regression to the mean
* Ashenfelter dip

Section 7 Advanced Cross Sectional II (Weeks 9 – 10)

* Matching estimators/ Propensity score matching
* Bootstrapping
* Regression discontinuity design
* Treatment Effects: ATE, LATE,…

## Part III: Time Series Econometrics [Weeks 11 – 15]

In the list of readings below, \* represents a paper that is appropriate for replication when writing your thesis during the summer.

Section 8: Introduction to Time Series Analysis (Week 11)

* Macroeconomic Data
* Serial Correlation
* Trends and Breaks
* Methodology

***Suggested Readings:***

* Sims, C. (1996), “Macroeconomics and Methodology", *Journal of Economic Perspectives*,10, Winter 1996, 105-120.

Section 9: Stationary Time Series Processes (Week 12 – 13)

* Stochastic Difference Equations
* ARMA Processes
* Seasonality
* Forecasting
* Maximum Likelihood Estimation
* Prediction Error Decomposition
* State-Space Form
* Kalman Filter
* Measures of Persistence

***Suggested Readings***

* Enders 1 - 4
* Hamilton 1-6, 13
* Diebold, F.X., 1998, The Past, Present, and Future of Macroeconomic Forecasting,
* *Journal of Economic Perspectives* 12, 175-192.

Section 10: Structural Analysis (Week 14)

* VAR Models
* Granger Causality
* Identification
* Impulse Response Functions

### Readings

* Hamilton 10-11
* Sims, C.A., 1972, Money, Income, and Causality, *American Economic Review* 62, 540-552. RP
* Sims, C.A., 1980, Macroeconomics and Reality, *Econometrica* 48, 1-48.
* Cooley, T.F. and S.F. LeRoy, 1985, Atheoretical Macroeconometrics: A Critique, *Journal of Monetary Economics* 16, 283-308.
* Blanchard, O.J. and D. Quah, 1989, The Dynamic Effects of Aggregate Demand and Supply Disturbances, *American Economic Review* 79, 655-673.
* Eichenbaum, M. and C.L. Evans, 1995, Some Empirical Evidence on the Effects of Shocks to Monetary Policy on Exchange Rates, *Quarterly Journal of Economics* 110, 975- 1009.
* Faust, J. and E.M. Leeper, 1997, When do long-run identifying restrictions give reliable results? *Journal of Business and Economic Statistics* 15, 345-353.
* Rudebusch, G.D., 1998, Do Measures of Monetary Policy in VARs Make Sense? *International Economic Review* 39, 907-931.
* Faust, J. 1998, The robustness of identified VAR conclusions about money, *Carnegie-Rochester Conference Series on Public Policy* 49, 207-244.
* Christiano, L.J., M. Eichenbaum, and C. Evans, 1999, Monetary Policy Shocks: What Have We Learned And to What End? In Handbook of Macroeconomics 1, 65-148.
* \*Kilian, L., 1999, Finite-Sample Properties of Percentile and Percentile-t Bootstrap Confidence Intervals for Impulse Responses, *Review of Economics and Statistics* 81, 652-660.
* Stock, J. and M. Watson, 2002, Vector Autoregressions, *Journal of Economic Perspectives* 15, 101-115.
* \*Canova, F. and G. De Nicolo, 2002, Monetary Disturbances Matter for Business Fluctuations in the G-7, *Journal of Monetary Economics* 49, 1131-1159.
* Uhlig, H., 2005, What are the effects of monetary policy on output? Results from an agnostic identification procedure, *Journal of Monetary Economics* 52, 381-419.
* \*Jordà, O., 2005, Estimation and Inference of Impulse Responses by Local Projections, *American Economic Review* 95, 161-182.
* \*King, T.B. and J. Morley, 2007, In Search of the Natural Rate of Unemployment, *Journal of Monetary Economics* 54, 550-564.
* Kim, C.-J., J. Morley, and J. Piger, 2007, Bayesian Counterfactual Analysis of the Sources of the Great Moderation, *Journal of Applied Econometrics*.

Section 11: Unit Roots and Structural Breaks (Week 15)

* Unit Roots
* Structural Breaks
* Trend/Cycle Decomposition
* Cointegration

Readings

• Hamilton 15-20

• Granger, C.W.J. and P. Newbold, 1974, Spurious Regressions in Econometrics,

*Journal of Econometrics* 2, 111-120.

• Nelson, C.R. and H. Kang, 1981, Spurious Periodicity in Inappropriately Detrended

Time Series, *Econometrica* 49, 741-751.

• Beveridge, S. and C.R. Nelson, 1981, A New Approach to Decomposition of

Economic Time Series into Permanent and Transitory Components with Particular

Attention to Measurement of the “Business Cycle”, *Journal of Monetary Economics* 7,

151-174.

• Nelson, C.R. and C.I. Plosser, 1982, Trends and Random Walks in Macroeconomic

Time Series: Some Evidence and Implications, *Journal of Monetary Economics* 10, 139-

162. RP

• Watson, M., 1986, Univariate Detrending Methods with Stochastic Trends, *Journal of*

*Monetary Economics* 18, 49-75. RP

• Clark, P., 1987, The Cyclical Component of U.S. Economic Activity, *Quarterly Journal*

*of Economics* 102, 797-814.

• Stock, J. and M. Watson, 1988, Variable Trends in Economic Time Series, *Journal of*

*Economic Perspectives* 2, 147-174. RP

• Cochrane, J., 1988, How Big Is the Random Walk in GNP? *Journal of Political Economy*

96, 893-920.

• Perron, P., 1989, The Great Crash, The Oil Price Shock, and the Unit Root

Hypothesis, *Econometrica* 57, 1361-1401.

• Campbell, J. and Pierre Perron, 1991, Pitfalls and Opportunities: What

Macroeconomists Should Know About Unit Roots, *NBER Macroeconomic Annual*

*1991*. RP

Bibliography

• \*King, R.G., C.I. Plosser, J.H. Stock, and M.W. Watson, 1991, Stochastic Trends and

Economic Fluctuations, *American Economic Review* 81, 819-840.

• Kwiatkowski, D., P. Phillips, P. Schmidt, and Y. Shin, 1992, Testing the Null

Hypothesis of Stationarity against the Alternative of a Unit Root, *Journal of*

*Econometrics* 54, 159-178.

• \*Zivot, E. and D.W.K. Andrews, 1992, Further Evidence on the Great Crash, the

Oil-Price Shock, and the Unit-Root Hypothesis, *Journal of Business and Economic*

*Statistics* 10, 251-270.

• Harvey, A.C. and A. Jaeger, 1993, Detrending, Stylized Facts and the Business Cycle,

*Journal of Applied Econometrics* 8, 231-247.

• Stock, J.H. and M.W. Watson, 1993, A Simple Estimator of Cointegrating Vectors in

Higher Order Integrated Systems, *Econometrica* 61, 783-820.

• \*Leybourne, S.J. and B.P.M. McCabe, 1994, A Consistent Test for a Unit Root,

*Journal of Business and Economic Statistics* 12, 157-166.

• Cochrane, J.H., 1994, Permanent and Transitory Components of GNP and Stock

Prices, *Quarterly Journal of Economics* 104, 241-263. RP (hw6)

• \*Cogley, T. and J.M. Nason, 1995, Effects of the Hodrick-Prescott Filter on Trend

and Difference Stationary Time Series: Implications for Business Cycle Research,

*Journal of Economic Dynamics & Control* 19, 253-278. RP

• Gregory, A.W., A.C. Head, and J. Raynauld, 1997, Measuring World Business Cycles,

*International Economic Review* 38, 677-701.

• \*Canova, F., 1998, Detrending and Business Cycle Facts, *Journal of Monetary Economics*

41, 475-512.

• Bai, J. and P. Perron, 1998, Estimating and Testing Linear Models with Multiple

Structural Changes, *Econometrica* 66, 47-78.

• \*Diebold, F.X. and C. Chen, 1998, Testing Structural Stability with Endogenous

Breakpoint: A Size Comparison of Analytic and Bootstrap Procedures, Journal of

Econometrics 70, 221-241.

• \*Ireland, P.N., 1999, Does the Time-Consistency Problem Explain the Behavior of

Inflation in the United States? Journal of Monetary Economics 44, 279-291.

• \*Engel, C. and C.-J. Kim, 1999, The Long-Run U.S./U.K. Real Exchange Rate,

Journal of Money, Credit, and Banking 31, 335-356.

• Murray, C.J. and C.R. Nelson, 2000, The Uncertain Trend in U.S. GDP, *Journal of*

*Monetary Economics* 46, 79-96.

• Hansen, B.E., 2001, The New Econometrics of Structural Change: Dating Breaks in

U.S. Labor Productivity, *Journal of Economic Perspectives* 15, 117-128. RP

• Engel, C. and J. Morley, 2001, The Adjustment of Prices and the Adjustment of the

Exchange Rate, NBER Working Paper 8550.

• Stock, J. and M. Watson, 2002, Has the Business Cycle Changed and Why? *NBER*

*Macroeconomics Annual 2002*, 159-218.

• Morley, J.C., C.R. Nelson, and E. Zivot, 2003, Why Are the Beveridge-Nelson and

Unobserved Components Decompositions of GDP So Different? *Review of Economics*

*and Statistics* 85, 235-243. RP

• \*Murray, C.J., 2003, Cyclical Properties of Baxter-King Filtered Time Series, *Review of*

*Economics and Statistics* 85, 472-476. RP

• \*Kose, M.A., C. Otrok, and C.H. Whiteman, 2003, International Business Cycles:

World, Region, and Country-Specific Factors, *American Economic Review* 93, 1216-

1239.

• Ahmed, S., A. Levin and BA Wilson, 2004, Recent U.S. macroeconomic stability:

Good policy, good practices, or good luck? *Review of Economics and Statistics,* 86, 824-

832.

• Kim, C.-J., J.C. Morley, and C.R. Nelson, 2005, The Structural Break in the Equity

Premium, *Journal of Business and Economic Statistics* 23, 181-191.

• Anderson, H.M., C.N. Low, and R. Snyder, 2006, Single Source of Error State Space

Approach to the Beveridge Nelson Decomposition, *Economic Letters* 91, 104-109.

• \*Levin, A.T. and J.M. Piger, 2006, Is Inflation Persistence Intrinsic in Industrial

Economies? Working Paper.

• Morley, J., 2007, The Slow Adjustment of Aggregate Consumption to Permanent

Income, *Journal of Money, Credit, and Banking* 39, 615-637.

• Morley, J., 2007, The Two Interpretations of the Beveridge-Nelson Decomposition,

Working Paper.

• Oh, K.H. and E. Zivot, The Clark Model with Correlated Components, Working

Paper.

• \*Sinclair, T., 2008, The Relationships between Permanent and Transitory

Movements in U.S. Output and the Unemployment Rate, *Journal of Money, Credit, and*

*Banking*, forthcoming.