University of Wisconsin-Whitewater

Curriculum Proposal Form #3

## New Course

**Effective Term:**

**Subject Area - Course Number:** **ECON 733 Cross-listing:**

(See Note #1 below)

**Course Title:** (Limited to 65 characters) Econometrics I

**25-Character Abbreviation:** Econometrics I

**Sponsor(s):** David Welsch

**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:** Entry into MS Economics Program; ECON 245 or equivalent

**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 one of the core courses that students entering the MS Economics programs will be required to take. It will expose the student to basic applied econometrics with a focus on the assumptions of the models and causality.

**Relationship to program assessment objectives:**

Since this course will be one of the core courses of the MS Economics degree, all students entering the MS Economics program will be required to take this course. In doing so, it will be the first step in providing students with the empirical skills they will need to estimate many models.

One of the key objectives of the MS Economics degree is to allow students to gain Quantitative and Statistical Proficiency. This course addresses the Statistical Proficiency aspect of this Learning objective and the specific student learning outcomes (traits) that this course will address are:

* Students are able understand and interpret results from multivariate linear models
* Students are able understand and correct weaknesses when using multivariate linear models with observational data
* Students are able understand use a variety of software packages to estimate multivariate linear models

**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 SPSS; currently SPSS is available on campus computers and there are 10 licenses of Stata available on campus computers.
* **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 I will focus on the estimation of models using various computer programs and understanding these models from an intuitive perspective. It introduces students to Regression methodology, focusing on assumptions of the framework, correcting for violations of the assumptions and examines the possibility of determining causality with observational data.

**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:**

ECON733 Econometrics I

University of Wisconsin-Whitewater, Department of Economics

Fall 2014

# MW 9:30-10:45

In Hyland 1301 (Some days we will meet in a computer lab Hyland 3101)

## Instructor: David Welsch

**Email:** welschd@uww.edu

**Class Web Page:** <http://facstaff.uww.edu/welschd/Econometrics733F2014/Home.htm>

**Office:** Hyland 4400 (telephone: 4715)

**Office Hours:** MW 7:30-8:30AM, 12:30-2:00PM, 3:35-4:05

Thursdays from 9:30-12:00

 **Also by appointment (Just email me or talk to me after class to set something up)**

**Required texts:** [W] Wooldridge, J.M., Introductory Econometrics: A Modern Approach, 4th edition, South Western

 [CT] Cameron, A. C., and Pravin K. Trivedi, Microeconomics Using Stata

**Other Resources:** The class web page will have notes that will allow you to follow along with the lectures and “fill-in-the-blank”.

Prerequisites

Admission into the MS program. Econ 245 or equivalent (an undergraduate statistics class where probability, probability distributions, confidence intervals, hypothesis testing, bivariate and multivariate regression was covered)

Course Description

This course will study applied econometrics with a focus on the estimation of several models using various computer programs and understanding these models from an intuitive perspective. One of the primary goals of this course will to examine the possibility of determining causality with observational data. Another major emphasis would be estimating and interpreting results from multiple regression models.

This course will examine the assumptions of the classic model, focusing on when they might be violated theoretically, testing for violations, and implementing corrections along with interpretation of estimated coefficients and model fit. We will start the course with a discussion of structural models vs. associations and emphasize the superiority of multiple regression relative correlation, along with examining how to interpret multiple regression results; we will end the course with examination of instrumental variables, natural experiments, an introduction to limited dependent variable models, and time series and basic forecasting.

**Grading Policy:** In this class we will have three exams (one is a “lab” exam), 5-7 homework assignments, a final, a class project, and some “pop” assignments. After many classes I 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 I 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.

 **I 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:** 1. If you are in need of special help in taking exams, please inform me early in the semester.

 2. The University of Wisconsin-Whitewater is dedicated to a safe, supportive and nondiscriminatory learning environment.  It is the responsibility of all undergraduate and graduate students to familiarize themselves with University policies regarding Special Accommodations, Academic 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).

 3. *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.*

\*Originated by: Wheaton College: Honor Code and Statement on Plagiarism.

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

**Schedule**

Section 0 (Podcasts)

Review of basic statistics:

* Measures of central tendency and dispersions
* Probability
* Probability distributions
* Definitions of unbiasedness, efficiency, consistency, plims,…
* Confidence intervals and hypothesis testing

Section 1 The Linear Regression Model [Weeks 1-3]

* Interpretation of models when variables are in level, log, square term, dummy (independent variables), percentages, and interactions while taking significance into account.
* What R-square and adjusted R-square mean
* Prediction
* Estimating OLS models in Excel, SPSS, SAS and Stata

Section 2 OLS models the theory [Weeks 4-6]

* The assumptions of the model
* Derive the bivariate model
* Verbal discussion of how the multivariate model is derived
* Discuss the theoretical intuition in the multivariate model and learn the equation for the standard error of the estimated coefficients.
* Hypothesis testing including joint tests of significance and confidence intervals
* Brief discussion of asymptotics and when we don’t need the assumption that the error term is normally distributed.
* More advanced measures of fit (what to do when model is transformed)

Part 3 Multicollinearity [Week 7]

* What it is
* Does it matter? If in doubt should you include an independent variable.

Section 4 Serial Correlation [Week 8]

* What it is, when (theoretically) you should expect it, what it does how to test for it, how to correct for it

Section 5 Heteroskedasticity [Weeks 9-10]

* What it is, when (theoretically) you should expect it, what it does how to test for it, how to correct for it

Section 6 Endogeneity and use of instrumental variables, 2SLS, and natural experiments [Weeks 11-12]

* Examining a further search for causal models
* Testing relevance of instruments
* Overidentification tests
* “Sample selection” in independent variables

Section 7 Limited Dependent Variable Models [Week 13]

* Discrete dichomous: Linear Probability models, probit, logit
* multimomial logit
* Count: Possion and negative binomial
* Censored: Tobit

Section 8 Sample selection[Week 14]

* Sample selection in independent variables (extension of IV estimators)
* Sample selection in dependent variable (Heckman Model)

Section 9 Introduction to time series and forecasting [Week 15]

* Granger Causality
* Nonstationarity
* Forecasting
* ARIMA models

**Bibliography:** (Key or essential references only. Normally the bibliography should be no more than one or two pages in length.)

Angrist, J. D., & Pischke, J. (2009). *Mostly harmless econometrics: An empiricist's companion*. Princeton, NJ: Princeton University Press.

Cameron, A. C., & Trivedi, P. K. (2005). *Microeconometrics: Methods and applications*. Cambridge, NY: Cambridge University Press.

Cameron, A. C., & Trivedi, P. K. (2009). *Microeconometrics: Using Stata*. College Station, Texas: Stata Press.

Greene, W. H. (2011). *Econometric analysis* . (7th ed.). Upper Saddle River, New Jersey: Prentice Hall.

Johnston, J., & DiNardo, J. (1997). *Econometric methods*. (4th ed.). McGraw Hill, Inc

Kennedy, P. (2008). *A guide to econometrics*. (6th ed.). Cambridge, MA: The MIT Press.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. (2nd ed.). Cambridge, Massachusetts: The MIT Press.

Wooldrigde, J. M. (2012). *Introductory econometrics: A modern approach*. (5th ed.). Mason, OH: South-Western Cengage Learning.