**Econometrics I**  
**Fall 2017, Module 2**  
**Course Syllabus**

**Instructor:** Olga Popova, Ph.D. (IOS Regensburg, CERGE-EI Prague, GSEM UrFU)  
**E-mail:** popova.olga.v@gmail.com  
**Course web page:** [http://home.cerge-ei.cz/opopova/teaching.html](http://home.cerge-ei.cz/opopova/teaching.html)  
**Office Hours:** by appointment

**Prerequisites:** Mathematical statistics, Probability theory.

**Course description:** This course is the first part in the Econometrics sequence. The aim of the course is to introduce the methodology used in applied empirical research. By the end of the course, students should be able to distinguish different econometric methods, know when each method may be applied and how to apply this method in empirical research. Lectures will be accompanied with practical exercise sessions in computer lab to assure the understanding of theoretical concepts and to provide the guidance for using these concepts in applied research. Primary softwares to be used during the course are STATA and Eviews.

**Grading** is based on class attendance and participation, two home assignments, a midterm exam, and a cumulative final exam.

*Midterm* is a closed book exam. However, students are allowed to use an A4 list with own hand-written notes. The use of unauthorized materials, and receiving and/or providing unauthorized help from/to other students would result in a failing grade for the exams. There will be no possibility to make up the midterm exam. The midterm exam will contain the material covered during the first half of the course.

*Final* is a written closed book, closed notes exam. The final exam will contain the material covered during the whole course.

*Home assignments* will contain empirical and theoretical parts and should serve as a preparation to the midterm and final exams. Students may work in a group of up to three people and submit one homework per group. All home assignments must be submitted. No late submissions will be accepted.

**Readings**

**Main textbook**  

**Supplementary textbooks**


**Course Outline**

**Lecture 1** [W, Ch. 1-4, 6]. Introduction to the course. The nature of econometrics. Types of data. The simple and multiple linear regression model (specification, derivation of OLS estimates, OLS properties, functional form of regression)

**Lecture 2** [W, Ch. 4, W, Ch. C6]. Hypothesis testing. t-test, F-test

Lecture 4 [CSW, Ch.6]. Testing for endogeneity, overidentifying restrictions, functional form, heteroskedasticity

Lecture 5 [W., Ch. 9, 16.1-2]. Endogeneity problem and its potential reasons (misspecification, omitted variable, measurement errors, and simultaneity)

Lecture 6 [W., Ch.9, 15, 16.3]. Solutions to endogeneity problem: proxy variables, IV estimator. 2SLS

[MIDTERM EXAM (based on Lectures 1-6)]

Lecture 7 [G, Ch.14; W, Ch. 16; CSW, Ch.9]. Systems of regression equations. Seemingly unrelated regressions (SUR) Simultaneous Equation Models (identification, estimation, applications to time series and panel data)


Lecture 9 [W, Ch. 12; E, Ch.2]. Serial correlation. AR(p), MA(q), ARMA(p,q) models. Box-Jenkins methodology

Lecture 10 [W, Ch.13, Ch. 17.5]. Introduction to panel data methods. Advantages of having panel data and problems (selectivity and heterogeneity bias). Pooled OLS

Lecture 11 [W, Ch. 14]. First differencing (FD), fixed effects (FE) model, random effects (RE) model, Hausman test, random coefficients (RC) model

Lecture 12 [W, Ch. 17]. Binary outcome models

Lecture 13 [CSW, Ch. 15]. Multinomial and ordered models

Lecture 14 [W, Ch. 17, CSW, Ch. 16]. Censored and Truncated Regression Models.

Ex. sessions:

Ex. session 1. Introduction to STATA. Estimating linear model with OLS. Hypotheses testing

Ex. session 2. Testing for endogeneity, overidentifying restrictions, functional form specification, heteroskedasticity. Correction for heteroskedasticity

Ex. session 3. IV and 2SLS estimation

HW1 deadline: December 12, 17.40 (before class)

Ex. session 4. Introduction to E-Views. Stationarity. Data transformation. Unit root tests

Ex. session 5. SUR and SEM estimation

Ex. session 6. Estimation of ARMA models. Box-Jenkins methodology

Ex. session 7. FD, FE, RE models estimation, Hausman test

Ex. session 8. HW 1 solution

Ex. session 9. Binary outcome models estimation

Ex. session 10-11. Estimation of multinomial, ordered, censored and truncated regression models

HW2 deadline: January 9, 13.00 (send by e-mail)

FINAL EXAM - January 2017