

**Royal Military College of Canada  
Department of Politics and Economics**

**Introduction to Econometrics  
ECE342B  
Winter 2010**

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## **Purpose and Contents**

The purpose of the introductory course in econometrics is to introduce students to the econometric theory and its application in order to equip them with the basic knowledge required for performing quantitative analyses of economic models. In this course we essentially cover the basic elements of the general econometric procedure in the context of the linear regression model, and deals primarily with least squares methods of estimation. The course emphasizes the intuitive understanding and practical application of these basic tools of regression analysis, as distinct from their formal theoretical development. To achieve this objective, students must be able to use specific statistical concepts which has been studied previously (ECE242 or any equivalent Stat. course). This course uses computers. Because of this, all of you are required to be (or become) familiar with the computer in the Arts lab (G442). The computer requirement is spread throughout the assignments and the project and you are required to familiarize yourself with the Eviews computer package (QMS), without losing focus on the main material in the course. During the first three weeks of the course I will organize tutorial sessions for students on the general instructions of the software and its use in empirical research.

Readings will be assigned prior to the beginning of each section in the course outline. The first part of the course introduces basic concepts of econometrics, while the second part

deals with the least squares method of estimation and inference in the context of the simple (two-variable) linear regression model. The third part of the course considers some important uses of linear regression analysis, including linear coefficient restrictions and covariance analysis. Finally, the fourth part of the course deals with various problems that commonly arise in applying the linear regression model to cross-section data, including multicollinearity, specification errors and heteroskedasticity.

It is assumed that students have successfully completed the introductory statistics course ECE242, and an introductory calculus course such as MAT208. However, a selective review of basic concepts in statistics is often advisable.

*For a brief review of random variables and probability distributions*, see Wooldridge (2009), Appendix B, pp. 714-745; Wooldridge (2006), Appendix B, pp. 728-762; or Gujarati (2003), Appendix A, Secs. A.1-A.6, pp. 869-895.

*For a review of hypothesis testing*, see Wooldridge (2009), Appendix C, Secs. C.5-C.7, pp. 762-782; Wooldridge (2006), Appendix C, Secs. C.5-C.7, pp. 780-802; or Gujarati (2003), Appendix A, Sec. A.8, pp. 905-912.

*For a review of estimators and estimation*, see Wooldridge (2009), Appendix C, Secs. C.1-C.4, pp. 747-762; Wooldridge (2006), Appendix C, Secs. C.1-C.4, pp. 763-779; or Gujarati (2003), Appendix A, Sec. A.7, pp. 895-905.

Finally, to be noted that the outline below is meant as a guide to your preparations and studies for this course.

### **Term project:**

This will consist in the development of an econometric research project and may be performed in groups formed by a maximum of three students. The content of the project will consist of the estimation of an economic model, the comparison of certain relevant hypotheses and prediction for extra-sample data. The project, in addition to explaining the econometric theory studied in class, will help students to become familiar with econometric packages used in empirical research (E-Views 5.0) and will account for 20% of the final mark.

## Academic Misconduct

Academic misconduct, including plagiarism, cheating, and other violations of academic ethics, is a serious academic infraction for which penalties may range from a recorded caution to expulsion from the College. The RMCC Academic Regulations Section 23 defines plagiarism as: “Using the work of others and attempting to present it as original thought, prose or work. This includes failure to appropriately acknowledge a source, misrepresentation of cited work, and misuse of quotation marks or attribution.” It also includes “the failure to acknowledge that work has been submitted for credit elsewhere.” All students should consult the published statements on Academic Misconduct contained in the *Royal Military College of Canada Undergraduate Calendar*, Section 23.

## Textbook

The required textbooks for the course are:

- R. Carter Hill, William E. Griffiths and Guay C. Lim (HGL) «Principles of Econometrics» Wiley; 3 edition, 2007.
- R. Carter Hill, William E. Griffiths and Guay C. Lim (HGL) «Using EViews for Principles of Econometrics» Wiley; 3 edition, 2008.

## Supplementary Reading

- Damodar N. Gujarati, *Basic Econometrics*, Fourth Edition. New York: McGraw-Hill, 2003. ISBN 0-07-233542-4. (R)
- Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, Fourth Edition. South-Western Cengage Learning, 2009. ISBN13: 978-0-324-58162-1. ISBN10: 0-324-58162-9. (R)
- Goldberger, A., «*Introductory Econometrics*», Harvard», 1998.
- Brooks, C., «*Introductory Econometrics for Finance*», 5<sup>eme</sup> edition, Cambridge University Press, 2004.
- Schmidt, P., «*Econometrics*», Marcel Dekker, 1976.
- Jack Johnston and John Dinardo «*Econometrics Methods* » 4 edition, McGraw-Hill/Irwin, 1996.

# COURSE OUTLINE AND READINGS

## 1. Linear Algebra and Math Review

- Brief math review (HGL, Appendix A)
- Review of random variables and probability distributions (HGL, Appendix B)
- Review of estimators and estimation (HGL, Appendix C)

## 2. Introduction to Econometrics (HGL, Chap. 1)

- Why Study Econometrics
- Econometric Model
- Statistical Inference

## 3. Simple Regression Model (HGL Chap. 2)

- Econometric Model
- Estimating the Regression Parameters
- The Gauss-Markov Theorem
- The Least Squares Estimators

## 4. Interval Estimation and Hypothesis Testing (HGL Chap. 3 and 4)

- Interval Estimation
- Hypothesis Tests
- Rejection Regions for Specific Alternatives

## 5. Time Series Analysis (HGL Chap. 12 and 13)

- Stationary and Nonstationary Variables
- Spurious Regressions
- Unit Root Tests for Stationarity
- Cointegration
- Regression When There is No Cointegration

## 6. Simultaneous Equations Models (HGL Chap. 11)

- A Supply and Demand Model
- The Reduced Form Equations
- The Failure of Least Squares
- The Identification Problem
- Two-Stage Least Squares Estimation

## Course Grading

<b>Exam</b>	<b>Percent of Final Course Grade</b>
Assignments	50%
Midterm Exam	30%
Term Project	20%