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**Departement Ekonomie - Department of Economics**

# Introductory Econometrics for Postgraduate Students 771

2020

Prof DP von Fintel & Prof WH Boshoff

# 1 Background

Econometrics is a sub-discipline of economics which relates strongly to statistics. It allows its users to quantify daily economic occurrences, verify theoretical relationships and provide practical evidence for most economic hypotheses and questions. Much of modern economics is substantiated with the use of data, and in particular econometric techniques.

Econometrics has developed as a discipline separate from statistics in the last century. This is because statistics largely uses experimental data, that are often not available in the social sciences. To accommodate the non-experimental data most often used in the latter, techniques have been adapted to most credibly measure the impacts referred to above (and many more hypotheses). Econometric models are often built to find causal results, which statistical models can only achieve if experimental data are used.

This course is designed to provide a comprehensive introduction to the field, which will assist you to understand the basic technical aspects of most papers you read in many postgraduate courses. The course will also equip you with the important tools to start conducting applied analyses with your own data. The material allows students to gather a foundational theoretical background in econometrics, but more importantly has a strong practical component to enable students to embark on their own studies (be it for an essay, an Honours/Masters dissertation, a first published academic paper or simply to provide real-world evidence on a question you have). The discipline of econometrics is an invaluable and indeed an integral tool for postgraduate study in Economics. You might find that this course is very broad in terms of economic theory: this is because every sub-discipline of economics uses this tool (and furthermore has its own specific issues to address in analysing the data). For instance, cross section analysis is most often applied to microeconomic settings (hence the sub-field of microeconometrics), while time series analysis is useful for macroeconomic analyses. Each of these sub-fields has its own peculiarities (in terms of technique, software and understanding), and both will be briefly introduced in this course. Econometrics is therefore a core course that lays the basis for further studies in the broader discipline of economics. Econometrics is, furthermore, a highly marketable piece of equipment in both the public and private sectors.

Though some students may already have a background in statistics or econometrics, it should be emphasised that this is not an explicit prerequisite for this course. Furthermore, students with a strong undergraduate grounding in these

disciplines may find some of the introductory concepts repetitive: these students should be warned, however, that econometrics has a slightly different flavour and emphasis to pure statistics, and that attendance of lectures and particularly the completion of tutorials is strongly advised.

## 2 Course Contacts

Role	Name	E-mail	Room	Consultation
Instructor	Prof Dieter von Fintel	dieter2@sun.ac.za	619A	By appointment
Instructor	Prof WH Boshoff	wimpie2@sun.ac.za	511	By appointment
Tutor	Grace Bridgman	gmmbridgman@gmail.com		During Lab session
Postgrad Administrator	Carina Smit	carina@sun.ac.za	506A	-
Internal Moderator	Dr Debra Shepherd	debrashepherd@sun.ac.za	-	-

## 3 Prescribed Text and Course Resources

- The core text for this course is  
Wooldridge, J.M., 2019. *Introductory Econometrics - A Modern Approach*, 7th Edition. South-Western.
- All information, announcements, lecture notes, assignments and tutorials will be posted on SunLearn:  
– <https://learn.sun.ac.za/>

## 4 Course Structure

### 4.1 Lectures

One formal lecture is scheduled for every week of the semester. It will take place from 09:00-11:00 on Wednesdays in CGW Schumann 205.

The purpose of the lectures is to (i) introduce the mechanics of the linear regression function; (ii) allow students to critically assess the assumptions required for estimates to be unbiased and efficient; (iii) introduce statistical inference; (iv) expose students to other important variations in econometrics, including non-linearity, qualitative variables, linear probability models, instrumental variables, and time series econometrics.

## 4.2 Lab Sessions and Tutorial Assignments

In addition to formal lectures, a weekly lab session is scheduled, usually on a Friday from 14:00 - 16:00 in EK2.1& EK2.2 on the top floor of the Neelsie Student Centre.

The purpose of the lab sessions is to prepare students for the weekly tutorial assignments and/or practical tests, the group projects that students will have to complete and also for the final exam by teaching students to (i) practically implement economic and econometric theory; (ii) organise, manipulate, and analyse economic data; (iii) perform quantitative analysis and estimate economic models using probabilistic tools; and (iv) assess, interpret, and present the results from econometric analyses.

### 4.2.1 Statistical Software

In this course students will learn to use **STATA** (for cross section work) and **E-Views** (for time series work), though anyone is welcome to experiment with packages that suit their purposes and preferences.<sup>1</sup>

### 4.2.2 Tutorial Assignments and Submission

The weekly tutorial assignments will require students to manipulate data, calculate summary statistics, estimate econometric models, perform post-estimation diagnostics, and interpret and present the results of their analyses. The problem sets are specifically designed to test (i) students' understanding of the econometric theory dealt with in the formal lectures; (ii) students' ability to practically apply this theory using the techniques taught during practical lab sessions; (iii) students' ability to extract meaning from economic data; and (iv) students' ability to interpret and present the results of analyses in a coherent and concise manner. Note that the tutorials count towards a sizable part of the final module mark and that attendance of lab sessions is strongly advised.

Each student must hand in completed tutorial assignments one week following the respective practical session in the box left outside room 506A by **12:00 noon**. Note that late submissions will not be graded and will be awarded a mark of 0%.

Tutorial assignments are intended to be comprised of individual work and each student must turn in their own unique version thereof. Plagiarism is a

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<sup>1</sup>Note that only limited help may be offered if students use alternative packages.

serious offense and will be sternly dealt with, without exception. Note that plagiarism is not difficult to detect: it includes letting another student copy your work, whether or not you copy theirs.

Occasionally, instead of tutorials completed in students' own time, the lab session may be used to complete a practical test on the computers, and that is submitted at the end of the session.

## 5 Assessment

### 5.1 Dates and assessment weights

The final mark for this course will be calculated with the following weights (please note the relevant dates of assessment/ for hand-in):

Assessment	Weight	Date
<i>Term test</i>	15 %	6 March 2020
<i>Group project 1</i>	10 %	3 April 2020 (submit output by 10:00, presentations at 14:00)
<i>Group project 2</i>	10 %	13 May 2020
<i>Tutorials</i>	15 %	Hand in one week after each lab session at 12:00 noon
<i>Final exam</i>	50 %	Exam timetable will be compiled by Ms Smit at the end of the semester

### 5.2 Assessment rules and guidelines

#### 5.2.1 Group Projects

Two group projects contribute to the final module mark. The first will cover a cross section topic and the second a time series topic. The aim is to expose students to the practical aspects of econometrics .

- Further instructions will be communicated during classes
- Please submit assignments electronically to [www.turnitin.com](http://www.turnitin.com)
  - Instructions for submission are available on the course website
  - Class ID: 23672122
  - Password: `metrics2020`

#### 5.2.2 Term test

- The test will cover material from Chapters 1-5, Appendix E and additional material provided in class
- Students are not required to submit a medical certificate or provide any other reasons if they miss this test.

### 5.2.3 Examination

- The final exam will consist of three sections.
- **Students who wrote the test in March** are only required to write the first and second sections, covering Chapters 6-9 and 15 (75 %) and Time Series Econometrics (25%). These students write for 3 hours. Students may not write the third section of the exam if they have attempted to write the test in March.
- **Students who miss the test in March** are required to write all three sections of the final exam ( $3 + 2 = 5$  hours). This assessment will be completed in one sitting with a short controlled break. The third section will examine the same material as the test in March (Chapter 1 to 5, Appendix E and supplementary materials). The paper for this section will only be handed out after the short break.
- **Students who miss both the term test and the examination** will not be awarded the credits for this module, and their results will be recorded as "incomplete". They will not be able to write the supplementary or medical exams, since no mark will be available for the term test. *Students who miss the term test in March therefore face the risk of not completing the module if they fall ill during the main examination period.*
- **Students who miss the examination due to illness** are obliged to present a valid medical certificate to the department, after which they may qualify to write the medical exam. Only students who wrote the term test can qualify for a medical examination. This assessment will take place together with the supplementary exam, and will be scheduled in the same week as all other supplementary exams of the postgraduate programme. The date will be announced in due course.
- **Students who write the first exam may qualify for a supplementary examination**, which will be written in the same week as all other supplementary exams of the postgraduate programme. After the first examination, passes, fails and supplementaries are awarded according to the following classifications:
- **Students who are ill and submit a medical certificate for the first examination** will not receive a mark for any of the assessments completed on the day of the examination. This entails that no mark will be awarded for section 3 of the exam should students have missed the term

Final Course Mark (FM)

		$0 \leq FM < 40$	$40 \leq FM < 50$	$50 \leq FM \leq 100$
<i>Exam Mark (EM)</i>	$0 \leq EM < 40$	Fail	Supplementary	Supplementary
	$40 \leq EM < 50$	Supplementary	Supplementary	Pass
	$50 \leq EM \leq 100$	Supplementary	Supplementary	Pass

test. Should this occur, module results will be recorded as "incomplete" and students should register again for the course.

- **Students who miss both the test in March and the exam**, will not be awarded the credits for this module, and results will be recorded as "incomplete" and students should register again for the course in the following academic year. This includes students who are ill during the first exam period.

## 6 Preliminary Schedule

<b>Lectures</b>		<b>Lab Sessions</b> ( <i>Grace Bridgman</i> )	
Wednesday 09:00-11:00 <i>205 CGW Schumann</i>		Friday 14:00-16:00 <i>E02.1 &amp; E02.2 Neelsie</i>	
<i>Introduction &amp; Cross Section Econometrics (Prof DP von Fintel)</i>			
05-Feb	Ch 1	07-Feb	Ch 2 (Lecture)
12-Feb	Ch 3	14-Feb	Stata Intro
19-Feb	Ch 4	21-Feb	Basic Estimation
26-Feb	Ch 5 & 6	28-Feb	Inference
04-Mar	Ch 7	06-Mar	<b>TERM TEST</b>
11-Mar	Ch 8 & 9	13-Mar	Non-linearity and Qualitative Data
18-Mar	Ch 15	20-Mar	IVs and other issues
25-Mar	<b>RECESS</b>	27-Mar	<b>RECESS</b>
01-Apr	<b>Graduations</b>	03-Apr	<b>GROUP PROJECT 1</b>
<i>Time Series Econometrics (Prof WH Boshoff)</i>			
08-Apr	Ch 10	10-Apr	<b>PUBLIC HOLIDAY</b>
15-Apr	<b>MINI-CONFERENCE</b>	17-Apr	Time Series Intro
22-Apr	Ch 11	24-Apr	Detrending
29-Apr	<b>RECESS</b>	01-May	<b>RECESS</b>
06-May	Ch 12 & 18	08-May	Persistent data
13-May	<b>GROUP PROJECT 2</b>	15-May	