

EC3303: Econometrics I

AY2022/23, Semester 1

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Office: AS2 #05-03

Consultation Hours: Fridays 4-6pm, or by appointment

Course Description:

Econometrics combines economic theory with mathematical and statistical tools to provide estimates that help answer important economic questions. This course will focus on the theoretical underpinnings, practical implementation and interpretation of results from the multiple regression model in cross-sectional data settings. It will also introduce students to panel data, fixed effects regression, and instrumental variables regression.

The main prerequisite for the course is familiarity with probability, statistics, and basic calculus (EC2303 or equivalent). For a review on probability and statistics, students can consult chapters 2 and 3 of the Stock and Watson textbook listed below. Although EC2104 (Quantitative Methods for Economic Analysis) is not a prerequisite, students are highly encouraged to read it before taking EC3303.

Text: The required textbook for this course is “**Introduction to Econometrics**” (Fourth Edition, Global Edition) by James H. Stock and Mark M. Watson, Pearson, ISBN: 9781292264455. Students can use earlier versions of the textbook.

Curriculum Management System: LumiNUS

How Course will be Conducted: NUS has launched a new Blended Learning 2.0 (BL 2.0) initiative. Under this initiative, courses are redesigned so as to embrace a blend of E-learning and face-to face instruction. EC3303 has been selected for BL2.0. Hence, the modes of learning are as follows:

Lectures: Online (E-learning)

Tutorials: In Person

Below, details are provided on how the lectures and tutorials will be conducted.

Lectures

Lectures will be conducted **online (E-learning)**. To avoid disruptions due to intermittent internet connection, a **recorded lecture** will be posted every **Wednesday** on LumiNUS. The lecture will be available for repeat viewing through the “Multimedia” tab on LumiNUS (click on the module “EC3303” → then on the left panel, under “Tools” → click on “Multimedia”). Students may

watch the lectures at their own convenience and time, although it is recommended that you watch them as soon as they become available each Wednesday.

As we are exploring the use of different modes of lecture presentation for subsequent semesters, in two of the weeks (tentatively week 4 and week 5), instead of the usual recorded lecture, we will use a recorded webcast. A poll will then be conducted to explore which mode of presentation students prefer. More details will be announced closer to the date.

Tutorials

Tutorials will take place **In-Person** at classroom **AS4-0110**. Students should attend the tutorial group which they sign up for.

Tutorial classes are held **once every 2 weeks**, starting from **Week 3** and ending Week 12. There is no tutorial in Week 13. There will be **5** tutorials in total. Students who sign up for the Odd week classes (groups starting with TD) will have their tutorial classes in weeks 3, 5, 7, 9, and 11. That is, for students from the TD groups, your first tutorial will be in week 3. Students who sign up for the Even week classes (groups starting with TE) will have their tutorial classes in weeks 4, 6, 8, 10, and 12. That is, for students from the TE groups, your first tutorial will be in week 4. Please see <https://nus.edu.sg/registrar/docs/info/calendar/ay2022-2023.pdf> to familiarize yourself with the NUS calendar weeks. Tutorials will comprise solving analytical questions and learning how to use STATA for data analysis. The list of questions and STATA files will be circulated on LumiNUS prior to tutorials. Marks are awarded for tutorial attendance and participation.

Please note that 24 October (Monday) is a public holiday. If your tutorial class happens to fall on that day, please attend any other tutorial slot that week as a make-up. Please keep your assigned tutor informed of your make-up tutorial attendance and participation by emailing your tutor after you have sat the make-up class.

Use of STATA: Being able to apply theoretical knowledge to real world data is one of the focal points of this course. As mentioned, students will be introduced to the STATA software package in the tutorials. They will later also be assigned homework problems that require using it. Students can access Stata both using the computers in the tutorial room, as well as virtually. More information will be provided by the Economics general office on how students can access STATA virtually.

Assessment: The weights are as follows:

Tutorial participation: 10%

E-Homework (2 E-homework assignments): 30%

Midterm Test: 20% (Wednesday, 5 October, 2pm-4pm)

Final Exam: 40% (Saturday, 19 November, 9am-11am)

Homework: There are **2** E-homework assignments. The assignments will have both analytical and empirical problems. Students will work on the homework assignments individually and will be given **3 days** to complete each assignment. Submission of the E-homework assignments will be online.

Homework 1 is due on the Friday of **week 7 (September 30th)**. Homework 2 is due on the Friday of week 13 (**November 11th**). More details on these homework assignments will be announced later.

Midterm Test and Final Exam: The Midterm test will be on **Wednesday, 5 October, 2pm-4pm**. The Final exam will be on **Saturday, 19 November, 9am-11am**. Please make yourself available during the abovementioned dates and times. Note that both the Midterm Test and the Final Exam are **closed book**.

Engagement: Please post your questions on course material on the LumiNUS discussion forum (under the left panel on “Tools”, click on “Forum”). For a more in-depth discussion of your queries, please do approach me personally. I will have dedicated consultation hours every week on Fridays, 4-6pm. Consultations will take place through Zoom. Simply log in to Zoom using the link below. If you are unable to make the dedicated consultation timing, you can also email me and we can arrange a separate consultation.

Consultation Zoom Meeting (every Friday, 4-6pm)

Join Zoom Meeting

<https://nus-sg.zoom.us/j/83502944248?pwd=K2c1WENobVBXV0YrcEliUlh4Z2s5dz09>

Meeting ID: 835 0294 4248

Passcode: 714459

Tentative course outline:

Date	Topic	Chapters (Stock and Watson)	Supplementary Material	Chapters (Stock and Watson)
Week 1	Introduction and Overview	SW: Ch. 1	Review of Statistics	SW: Ch. 2,3
Week 2	Bivariate Linear Regression (I)	SW: Ch. 4		
Week 3	Bivariate Linear Regression (II)	SW: Ch. 4,5		
Week 4	Bivariate Linear Regression (III)	SW: Ch. 5		
Week 5	Multiple Regression (I)	SW: Ch. 6		
Week 6	Multiple Regression (II)	SW: Ch. 6,7		
Recess Week				
Week 7	Multiple Regression (III)	SW: Ch. 7		
Week 8	Midterm Test: October 5th (Wed), 2-4pm (No lecture this week)			
Week 9	Nonlinear Regression Functions (I)	SW: Ch. 8		

Week 10	Nonlinear Regression Functions (II)	SW: Ch. 8		
Week 11	Fixed Effects Regression	SW: Ch. 10		
Week 12	Instrumental Variables Regression	SW: Ch. 12		
Week 13	Assessment of Regression-based Studies and Conclusion	SW: Ch. 9		
Reading Week				
	Final Exam: November 19th (Sat), 9-11am			

Learning outcomes (i.e. what you should be able to do after completing this module):

- Specify and estimate multiple regression models based on economic theory and Omitted Variable Bias considerations.
- Incorporate potential nonlinear effects through polynomials, logarithms, and interaction terms when specifying and estimating multiple regression models.
- Formulate and test hypotheses based on two or more regression coefficients.
- Evaluate the fit of estimated regression models using appropriate measures.
- Critically assess the internal and external validity of existing economic studies based on multiple regression
- Understand how fixed effects regressions can be used to mitigate omitted variable bias.
- Understand how instrumental variables regressions can be used to mitigate omitted variable bias.