ECON3121 INTRODUCTORY ECONOMETRICS
Spring 2025

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Course Description: Econometrics bridges the gap between economic theory and real-world data using tools from statistics and computer science. The era of big data and AI has drastically changed the way of economic behavior and business models, which also brings new perspectives in the field of Econometrics. This course introduces you to basic econometric techniques and their applications in economic/policy data analysis. The main contents of this course include basic econometrics modeling, linear regression model, parameter estimation and statistical inference, multivariate regression models, nonlinear models, discrete variables, endogeneity and instrumental variables, and selected topics in causal inference. This econometrics course aims to not only introduce the fundamentals of econometric theory, but also provide a chance for students to learn how to implement these models in real economic problems using common software such as R, Matlab, Stata, Python, etc. AI-aided learning and teaching would be implemented as well.

Prerequisites
Basic probability and mathematical statistics, linear algebra, and calculus.

Textbook
Notice the following textbooks are not required but they are recommended for readings.
Recommended:
(SW) Stock, James and Mark Watson. *Introduction to Econometrics*. (third or above edition), Pearson.

* My lecture notes mostly follow this book, and homework. If you want to buy books my suggestion is this one.

Jeffrey M. Wooldridge. *Introductory Econometrics*. (6th or above edition), South-Western.
* A popular undergraduate level textbook.

Course Webpage
I will distribute teaching materials such as lecture notes, homework for this class through Blackboard. You also submit all assignments on Blackboard. Check it frequently for new announcements.

Tutorials
We also have about 7 tutorials for this class that is separate from the lectures. The TA will discuss homework solutions and demonstrate some sample coding for data analysis. The tutorial schedule will be announced through Blackboard. You will receive full credit (5%) from attending ALL tutorials. Missing one tutorial will earn 4%. Missing two will earn 2%. No credits for missing more than two tutorials.

Computer Package and free online learning resources
Students will use popular software such as STATA (which is the SW textbook's main data resource), and R, Matlab, Python or any other software that they would prefer to analyze data.
-You do NOT need to buy Stata/Matlab. These are available at the computer lab (916) in ELB 9/F, with your "Computing ID" and "PC LAN password". More details will be provided on how to access Stata remotely. One good introduction to Stata can be found at https://www.princeton.edu/~otorres/Stata/
And a resource for Python is here https://aeturrell.github.io/coding-for-economists/intro.html There are many free online resources for R and Matlab as well.
-R, Python are free.
MIT open courseware: https://ocw.mit.edu/courses/14-310x-data-analysis-for-social-scientists-spring-2023/

Homework
There will be six graded problem sets. Homework will be submitted via the Blackboard before its due time. Late homework will be discounted 50%.

Examinations
There will be one mid-term exam and one final exam. The mid-term carries a weight of 40% of total grade. The final exam has 40% weight. The final will be cumulative and cover all the course materials.

All exams will be closed book/note. Please bring a basic scientific calculator (non-programmable) to the exams. There will be **no make-up exams**. If you miss a midterm with justifiable reasons, the weight of the missed mid-term will be shifted to the final exam (80%).

Performance Evaluation

The grades in this course will be based on the following:

Assessment Activities	Weighting
Attendance	10%, of which classroom 5%, tutorial another 5%
Six problems sets	10%
Mid-term	40%
Final Exam	40%

Tentative Schedule

The teaching mode is on-site face-to-face lectures throughout the semester unless otherwise noticed. Please note here is that the schedule below is tentative, meaning that I may need to change things as the session progresses.

Topics	Reading
Topic 1: Introduction and review of basic statistics	SW Ch.1-3
Topic 2: Simple linear regression: Estimation	SW Ch.4
Topic 3: Simple linear regression: Inference	SW Ch.5
Topic 4: Multiple regression: Estimation	SW Ch.6
Topic 5: Multiple regression: Inference	SW Ch.7
Topic 6: Nonlinear regression function	SW Ch.8
Topic 7: Assessing studies based on multiple regressions	SW Ch.9
Topic 8: Instrumental Variables	SW Ch.12
And other selected topics contingent on the pace of the teaching.	

- 'SW' stands for Stock and Watson (3rd edition and above).

Guidelines on the use of AI tools

In this class, students are allowed to use AI tools for in-class learning activities and assignments. Students should make explicit acknowledgement of the use of these tools. The followings are some examples regarding how to acknowledge and make citations of using AI. Students should be aware of the limitations and appropriate use of these tools.

> **Use of AI tools is allowed with explicit acknowledgement and proper citation**
>
> Students may use some AI tools in some class activities and assignments on the condition that they make explicit acknowledgement and proper citations of the input from AI tools.

Acknowledging support from AI tools

Students are required to acknowledge all functional uses of a generative AI tool and cite it when they paraphrase, quote, or incorporate into their own work any content (whether it is text, image, data, or other format) that was created by it.

i. An example of acknowledgement

'I acknowledge the use of (name of AI tool – e.g. ChatGPT (https://chat.openai.com/) to (specify the support, e.g. ask for computer codes, plan and write my essay, generate some ideas for the content, ask for examples of data collection instruments, check some knowledge points, etc.).

ii. An example of citation

OpenAI. (2023). *ChatGPT* (Mar 20 version). https://chat.openai.com/chat

(Students are reminded that due to the rapid developments of generative AI tools, some citation formats may be updated regularly.)

iii. An example of including texts generated by an AI tool in their work

"The following text was generated by an AI tool / language model (ChatGPT):"
[Insert the text generated by ChatGPT here.]

iv. An example of including texts generated by an AI tool and the prompts that were used to elicit the text from the AI tool

"[The prompt], as generated by an AI language model (ChatGPT):"
[Insert the text generated by ChatGPT in response to the prompt.]

Students are reminded to learn and use the AI tools responsibly and ethically and be aware of the limitations.

Students are reminded to clarify with the course teacher and obtain permission if necessary when in doubt.

Academic Honesty:

Attention is drawn to University policy and regulations on honesty in academic work, and to the disciplinary guidelines and procedures applicable to breaches of such policy and regulations. Details may be found at http://www.cuhk.edu.hk/policy/academichonesty/