Quantitative Methods (4SSPP109)

Department of Political Economy
King's College London
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Please read every section of this Syllabus fully and carefully before the module starts!

I. Module Outline

This module introduces students to probability, statistics, and econometrics. It provides the tools to carry out basic data analysis: starting with real world questions, translating them into statistical problems, performing appropriate statistical tests, and interpreting results. This will require a conceptual understanding of data analysis, inference, data quality, and the conditions under which we can trust statistical results. Throughout the course, students acquire hands-on experience of data analysis using the STATA software.

II. Learning Outcomes

At the end of the module students will be able to

- Formulate statistical hypotheses.
- Summarize data using key statistics and graphs.
- Perform basic data analysis.
- Use the STATA software for basic data summary, visualization, and analysis.
- Appropriately interpret and read critically studies using basic data analysis.

III. Course Organization, Materials and Resources

A. *Textbooks*

a. Sheldon Ross, *Introductory Statistics*, 4th Edition (Chapters 1 to 10)

b. James H. Stock and Mark W. Watson, *Introduction to Econometrics*, Global Edition (Chapter 4 to 6)

Note: Both textbooks are available to read online in eBook format through King's Library. There should also be a limited number of physical copies in the library that those of you who prefer a physical book can borrow. Of course, you always have the option to buy a physical copy of the book(s) if you prefer.

B. *STATA Statistical Software*

The STATA statistical software will be used in this module (http://www.stata.com/). To install STATA, you need a STATA user license and to download the software. Both are available to you through King's. *Please make sure to install STATA on your computer and take a first look ASAP*, and surely before the first seminar.

All King's devices can install STATA from the software center (the software center is an app that is built into all King's devices).

To install STATA on a non-King's device, navigate to the website linked below, sign in with your King's account, and search for STATA:
https://kcl.onthehub.com/WebStore/Welcome.aspx

If you have trouble installing STATA from the above procedure, please compile a Software Request form at the following link
https://kcl-dwp.onbmc.com/dwp/app/#/itemprofile/309

If you have trouble installing/accessing STATA, please contact IT service desk via email (itservicedesk@kcl.ac.uk) or phone (020 7848 8888). Please note that the instructor and seminar leaders do not have the tools to help with the technical aspects of accessing STATA through King's – you need to contact King's IT services for assistance.

Take a quick tour of the STATA interface here:
https://www.youtube.com/watch?v=L8iIj_8lhRc

For tips and tutorials on using Stata beyond what you learn in the weekly lab sessions, there are numerous free online resources, such as those available through the Institute for Digital Research and Education at UCLA

(https://stats.idre.ucla.edu/stata/) or Princeton Statistical Services (https://www.princeton.edu/~otorres/Stata/). The STATA manual is also excellent.

C. *Keats*

Keats will be used to upload materials, make announcements, and administer assignments and quizzes.

D. Weekly readings

Reading regularly is key to success in this course. Every week, you will be assigned a reading, *to be done before the Monday lecture*. The expected calendar of readings is outlined in Section IV below.

E. Communications

We will often send you emails and post new materials on Keats. *To succeed in this module, you will need to stay updated by checking your KCL email and the Keats page of the course regularly.*

F. Contacting the instructor and the seminar leaders

The best way to reach out to the instructor or seminar leader is to send an email.

The instructor's office hours are on Tuesday 10-11 and Thursday 11-12, online on Microsoft Teams – book by emailing the instructor.

The seminar leader's office hours will be communicated by your seminar leader.

If you have feedback or concerns, feel free to bring them up with your seminar leader or the instructor – we will do our best to address them.

G. Policy about extensions requests for coursework

Please note that, per King's policy, the instructor (and seminar leaders) *cannot* grant extensions for coursework. King's has a process called 'mitigating circumstances', where students can request deadline extensions on coursework if they are facing difficult circumstances. You can find information online, for example here: https://www.kclsu.org/help/advice/academicsupport/mc/

IV. The Plan

Following is a *tentative* schedule for the course. Take it as a broad indication: it is subject to change based on how fast or slow we will go as a group. Any change will be announced in advance as much as possible. Please refer to Keats for an updated schedule and for all module deadlines.

Week	Reading (due before lecture)	Lecture Day & Topic	Seminar Topic
22	Ross Ch 1-2	*Jan 15* Introduction: Scientific questions & Data; Exploring, describing & visualizing data.	Review: data description & visualization
23	Ross Ch 3	*Jan 22* Using statistics to summarize datasets.	STATA Lab 1
24	Ross Ch 4	*Jan 29* Probability I: Definitions & basic properties	Review: Probability (1)
25	Ross Ch 5-6	*Feb 5* Probability II: Random variables & their distributions	Stata Lab 2
26	Ross Ch 7	*Feb 12* Probability III: The distribution of sampling statistics	Review: Probability (2)
27	No new reading	Reading week (Feb 19 to Feb 23) No lectures or seminars.	
28	Ross Ch 8	*Feb 26* Statistics I: Estimation	Review: Statistics (1)
29	Ross Ch 9-10	*March 4* Statistics II: Testing statistical hypotheses	Stata Lab 3
30	S&W Ch 4	*March 11* Linear Regression I	Review: Statistics (2) + Linear Regression (1)
31	S&W Ch 5	*March 18* Linear Regression II	Stata Lab 4
32	S&W Ch 6-7	*March 25* Linear Regression III	Review: Linear Regression (2)

Ross = Sheldon Ross "Introductory Statistics", 4th Edition
S&W = Stock and Watson "Introduction to Econometrics", Global Edition
Note: both textbooks are freely available to read online through King's library services
Each week's reading is due before the Monday lecture.

V. Assessment Methods

The course requirements consist of:

- Attendance and participation: 10%
- Coursework: 30%
- Final Exam: 60%

The take-home coursework will consist in a number of exercises (including a STATA replication project) and open answer questions. It will be administered and submitted via Keats. It will be due on Thursday 28 March 28 2024.

VI. Accommodations for disability

King's is committed to disability equality and inclusion so that all disabled people and those with long term conditions are included and feel valued, and that barriers are understood and overcome.

For more information:
https://www.kcl.ac.uk/disability

VII. Academic honesty & integrity

Please make sure you are familiar with King's policy on academic honesty and integrity, and with the guidelines on avoiding plagiarism.

https://www.kcl.ac.uk/campuslife/acservices/conduct/201920-documents/student-guidance-on-academic-honesty-integrity.pdf