

Time Series Econometrics and Business Forecasting**ECON 4304, Spring 2019****Department of Economics, HKUST****Instructor Information:**Instructor: WANG, Peng (pwang@ust.hk)

Office: Rm 6082, LSK Bldg

Phone: 2358-7630

Office Hours: by appointment

Lectures:

Tuesday and Thursday 9:00 - 10:20 AM, Rm 1032, LSK Bldg.

Tutorial Sessions: TA: TBA. (tba@ust.hk)

Tuesday 18:00 - 18:50, Rm 1014, LSK Bldg.

The tutorial is **not** weekly. The TA will make an announcement through Canvas when there is a tutorial session.

Textbook: The course material will be mainly based on lecture notes and slides. The following book will also serve to help you to enhance your learning of the content in the lecture notes and slides.

Chris Brooks (2014): "Introductory Econometrics for Finance." 3rd Edition, Cambridge University Press.¹

Course Web Site: <http://canvas.ust.hk>

Students should be able to access the course website for ECON 4304 on Canvas using their ITSC accounts. I will post the teaching material before each class. You shall also check the course website at least twice a week for important announcement such as the homework information.

Course Description:

This course will introduce students to econometric techniques and their applications in economic time series analysis. We will first review key concepts in multiple regression using time series data. We then introduce the test for structural change. We will walk through both the theory and applications of ARMA models for forecasting, estimation of dynamic causal effects using vector autoregression, unit root and cointegration, conditional heteroskedasticity through the lens of (G)ARCH models. Emphasis will be put on special features of economic time series data and the associated statistical tools. The free software Gretl will be used for computer-based calculation.

(Gretl is available at: <http://gretl.sourceforge.net/>)

Prerequisites: Econ 3334 or consent of instructor.

¹ Other editions such as the 1st (2002) and 2nd (2008-2012) also work.

Course Requirements:

Homework (15%): There will be about 5 problem sets, assigned during the semester. These problem sets focus on computational and analytical exercises. Students may work in groups, but each student must submit his/her own solution. **Students submit their solutions through Canvas.** Main solution files must be in Microsoft Word or PDF format. Data files must be read by Microsoft Excel. The due dates will be specified in each assignment. **Do double-check that you have clicked the "submit" button after you upload your solutions. Email submissions will not be accepted.** Late submission will be not be accepted unless you have a verifiable medical reason.

Midterm (30%): **Date:** March 19th (Tuesday). **Time and Location:** the same as the lecture. Closed books and notes. Switch your phones to silence mode. Do not bring your own cheat sheet. I will attach one formula sheet and scratch paper to the exam paper. Do not use smart phones, tablets, or laptop computers. Non-programmable calculators may be used. The midterm coverage will be announced in class.

Final (55%): **Time and Location:** TBA. Same rule as the midterm. The final will be cumulative and cover all course materials.

Exam Policy: There will be no make-up exams for the midterm. If you miss the midterm, you will receive zero for that exam. The only exception is a verifiable medical reason, in which case the weight of the midterm will be moved to the final exam. If you miss the final exam, you will receive an "F"(fail) for the course. The only exception is that you successfully apply a make-up exam formally through the school. In such a case, I will allow you to do a make-up exam. There is zero tolerance of cheating in the exam. The case of cheating will be reported to both the department and the school level. We will check your **school ID cards** during all exams.

Re-grading Policy: Contact your TA regarding any grading issue within one week from the time the grade is released. Re-grading of exams will not be allowed if they are written in pencil.

Course Intended Learning Outcomes: Upon completion of the course, you will be able to:

1. Understand key concepts in time series econometrics and acquire basic analytical skills in time series analysis.
2. Construct an appropriate time series regression model to analyze a given economic data set, and then conduct statistical inference and interpret the results.
3. Use the statistical software Gretl to conduct time series analysis and forecast.
4. Collect data set to conduct empirical analysis, and provide answers to economic questions.
5. Present your understanding of certain economic problems verbally and in writing, and use empirical results to justify your explanation.

Tentative Schedule:

	Date	Day	Topic	Reference
1	Jan.31	Thu	Topic 1: Introduction	Ch.1
2	Feb.12	Tue	Topic 2: Review of linear regression	Ch.2
3	Feb.14	Thu		Ch.3
4	Feb.19	Tue	Topic 3: Review of regression diagnostics	Ch.4
5	Feb.21	Thu		Ch.4
6	Feb.26	Tue	Topic 4.1: Univariate time series models: autocorrelation	Ch.5
7	Feb.28	Thu		Ch.5
8	Mar.5	Tue	Topic 4.2: Univariate time series models: information set	Ch.5
9	Mar.7	Thu	Topic 4.3: Univariate time series models: MA	Ch.5
10	Mar.12	Tue	Topic 4.4: Univariate time series models: AR, ARMA	Ch.5
11	Mar.14	Thu	Topic 4.5: Univariate time series models: model selection	Ch.5
12	Mar.19	Tue	Mid-term exam (in class)	
13	Mar.21	Thu	Topic 5: Multivariate time series models: VAR	Ch.6
14	Mar.26	Tue		Ch.6
15	Mar.28	Thu		Ch.6
16	Apr.2	Tue		Ch.6
17	Apr.4	Thu	Topic 6: Multivariate time series models: cointegration	Ch.7
18	Apr.9	Tue		Ch.7
19	Apr.11	Thu		Ch.7
20	Apr.16	Tue		Ch.7
21	Apr.25	Thu	Topic 7.1: Volatility models: introduction	Ch.8
22	Apr.30	Tue	Topic 7.2: Volatility models: ARCH/GARCH	Ch.8
23	May.2	Thu		Ch.8
24	May.7	Tue	Topic 7.3: Volatility models: applications	Ch.8
25	May.9	Thu	Topic 8: A guide for empirical study	Ch.13

Remark: no classes on Feb 5, 7, Apr 18, 23 due to public holidays or mid term break.