YaleNUSCollege

Module:	**Time Series Analysis**
Semester:	**Academic Year 2021/22, Semester 2**
Instructor:	**Ran Song**
Office hours:	TBD (or by appointment)
Office :	RC1-01-03H
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Course Overview

This class studies theory and application of time series methods in econometrics, including autoregressive, moving average, ARIMA models, estimation with stationary and non-stationary processes, VARs, unit roots, ARCH mode, GARCH Model, forecasting, and applications to macroeconomics, finance and public economics.

Course Schedule

Regular Class Lecture:	Monday 16:00 – 18:00
STATA session:	Tuesday Tue 16:00 – 17:00

Required Textbook:

"*Introductory Econometrics: A Modern Approach*" by Jeffrey M. Wooldridge, Sixth Edition, Cengage Learning

Enders, W., 2015. Applied Econometric Time Series, Fourth Edition.

Optional Supplementary Textbook:

A Guide to Econometrics, 6th Edition by Peter Kennedy, The MIT Press.

Grading:

Four Problem Sets	20%
Class Participation	20%
Midterm Exam	20%
Final Exam	40%
	100%

Classroom Participation, Projects, and Exams:

1. Classroom Participation (20%)

Attendance and Participation grade will be assigned on the frequency that you participate and ask reasonable questions during class. Attending office hours or asking questions after class, although welcome, will not contribute to your attendance grade.

2. Assignments (20%).

Collaboration Policy: Assessment for this course will be based on problem set assignments, midterm, final exams and evaluation of in-class participation. The format, grading and exact due dates of the assignments will be discussed during lectures. You may work in pairs when figuring out your assignments. **BUT** you should acknowledge your collaborator at the top of your assignment submission. Unless otherwise specified, students have to hand in individually written and composed assignments.

Late submission policy: **Unless supported by a VR's note or a MC, late assignments will be penalized 25% of the allocated marks for each day that the assignment is late.** Problem sets may include an empirical component that requires the use of STATA. For these data questions, you would need to hand in the STATA log file of the commands ran as well as the computer output. Further details will be forthcoming as the semester progresses.

3. Midterm Exam (20%) and Final Exam (40%)

Midterm will held during class lecture time. Students who are unable to write the midterm because of an illness, family emergency or religious observance will have the midterm weight shifted to the final examination. **Documentation MUST be provided within three business days after the midterm exam. Students should be aware that no "make-up" midterms will be given.** There will be no make up midterm or final exams. If you believe you are going to miss one, and you have a legitimate reason, please let me know in advance.

Course Outline:

I. ARIMA models

Week 1 -2 : Jan 10 – 21	Autoregressive, Moving average, ARIMA models
	Assignment 1 handed out
	STATA Lab sessions 1&2

II. Stationarity and Non-Stationarity

Week 3 : Jan 24 – 28	Stationary and Non-Stationary processes
	STATA Lab session 3
Week 4 : Jan 31 – Feb 4	Unit-Root Process and Spurious Regressions
	STATA Lab session 4
	Assignment 1 due
	Assignment 2 handed out
Week 5 : Feb 7 – 11	Time-Series Regression Models and Serial Autocorrelation
	STATA Lab session 5
Week 6 : Feb 14 – 18	Distributed Lag Models
	STATA Lab session 6
	Assignment 2 due

Recess Week: Sep 18 – Sep 26

Week 7 : Feb 28 – Mar 4	Dickey-Fuller test
	Review for the mid-term
	Assignment 3 handed out

III. Cointegration and Error Correction Model

Week 8: Mar 7 – 11	Cointegration and Error Correction Model: Part 1
	Midterm on Mar 7
Week 9: Mar 14 – 18	Cointegration and Error Correction Model: Part 2
	STATA Lab session 7
	Assignment 3 due
	Assignment 4 handed out this week
Week 10: Mar21– 25	ARCH and GARCH Model: Part 1
	STATA Lab session 8

V. ARCH and GARCH Model

Week 11: Mar28 – Apr1	ARCH and GARCH Model: Part 2 Assignment 4 due STATA Lab session 9
Week 12: Apr 4 – 8	More Time Series Methods Review for the final exam

IV. Applications of Time Series Models

Week 13: Apr 11 – 15	Applications of Time Series Models in Empirical Research