

Time Series Analysis

STA457H1 F

2020-09-22

Instructor and teach assistants

- **Instructor:** Jen-Wen Lin, PhD, CFA
- **Office Hours:** TBA
- **Class Time:** Tuesday 0500-0600 pm (live)
- **Video Streams:** TBA
- **Email:** jenwen.lin@utoronto.ca
- **Teaching Assistant:**
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Please check announcements on Quercus regularly for updates.

Course description

- This course introduces several practical techniques for time series analysis. Topics in this course include conventional time series models, such as Box-Jenkins methods (transfer function model, ARIMA models), multivariate time series analysis (Vector autoregression, co-integration), and nonlinear time series models (GARCH/MGARCH models). These techniques can be applied to different disciplines, such as economics and finance. After this course, students are expected to gain hands-on knowledge on how to analyze and model time series data using different techniques.
- R will be used in class as well as for quiz/tests and assignment.

Schedule (tentative)

Tentative			
Date	Schedule		
15-Sep	Introduction and course logistics		
22-Sep	Classical decomposition		
29-Sep	Box-Jenkins approach		
06-Oct	Box-Jenkins approach		
13-Oct	Box-Jenkins approach and forecast		
20-Oct	Catch-up and Review		
27-Oct	In-class test 1		
03-Nov	Transfer function noise model and time series regression	Return test 1 this week	Assignment available
10-Nov	Fall reading week		
17-Nov	Vector autoregression and cointegration		
24-Nov	GARCH/MGARCH models/Other topics		
01-Dec	Catch-up and Review	Return assignment this week	
08-Dec	In-class test 2		

Marking scheme

Tentative				
Items	Course evaluation	Points	# of evaluation	Total
1	Random Quiz*	10	2	20
2	Assignment	30	1	30
3	In-class tests**	25	2	50
				100

- **FOUR** quizzes will be given during the semester.
 - * **ONE** question (5~10 minutes) each time
 - * Quiz will be announced at least 12 hours in advance
 - * Quiz will be held at 5:30pm
 - * The highest **TWO** marks will be used in the marking scheme
- **TEN** questions in each test (120 minutes)
- **FIVE** percent penalty per day for late submission (assignment)
- Please **READ** and **OBEY** academic integrity at University of Toronto, or the last section of this document.

Reference book (optional)

1. Wei (2005), Time Series Analysis—Univariate and Multivariate Methods.
2. Jonathan D. Cryer, Kung-Sik Chan(2008), Time series analysis : with applications in R
3. Rob J Hyndman and George Athanasopoulos (2020), Forecasting: Principles and Practice
4. George E.P. Box, Gwilym M. Jenkins, Gregory C. Reinsel. (2008) Time Series Analysis, Fourth Edition
5. **More to come**

Academic integrity

All students, faculty and staff are expected to follow the University's guidelines and policies on academic integrity. For students, this means following the standards of academic honesty when writing assignments, collaborating with fellow students, and writing tests and exams. Ensure that the work you submit for grading represents your own honest efforts. Plagiarism—representing someone else's work as your own or submitting work that you have previously submitted for marks in another class or program—is a serious offence that can result in sanctions. Speak to me or your TA for advice on anything that you find unclear. To learn more about how to cite and use source material appropriately and for other writing support, see the U of T writing support website at <http://www.writing.utoronto.ca>. Consult the Code of Behaviour on Academic Matters for a complete outline of the University's policy and expectations. For more information, please see <http://www.artsci.utoronto.ca/osai> and <http://academicintegrity.utoronto.ca>.