

STAT 7260 Section A01
Time Series Analysis
Fall 2018

Time MWF 9:30 a.m. – 10:20 a.m.
Location 418 Machray Hall
CRN 14749

Instructor Dr A.Thavaneswaran
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Text: Time Series Analysis, Univariate and Multivariate Methods,
by W.S. Wei. Published by Addison Wesley, 2nd Edition, 2006.

Web Pages UMLearn: <http://umanitoba.ca/umlearn>

Office Hours: MF 8:30 a.m. - 9:20 a.m.

If the above times are not convenient for you, please call, email or speak to me to arrange an alternate time to meet. I will do my best to return all email or telephone messages within 24 hours.

Evaluation

Test 1	20%
Test 2	20%
Project on Financial Risk forecasting	10%
Final Examination	50%

The following are the minimum percentage grades required to receive each of the various letter grades: A⁺ (90%), A (80%), B⁺ (75%), B (70%), C⁺ (65%), C (60%), D (50%).

Exam Information

The Test 1 will be held on **Friday October 5, 2018 in class** and Test 2 will be held on **Friday November 9, 2018 in class** . The final exam will be 3 hours(9am to 12 noon) in duration and will be held on **Monday December 10, 2018**.

Assignments

There will be no formal assignments in this course. However, numerous practice problems (with solutions) will be posted. Students are strongly encouraged to try these practice problems on a regular basis.

Supplementary Resources

The following books/papers are highly recommended for reading and extra practice.

- *Statistical Methods for Forecasting*, by Abraham, B. and Ledolter, J. (1983). Published by John Wiley.
- *Statistics and Data Analysis for Financial Engineering with R examples* (Second Edition) by Ruppert, D. and Matteson, D. (2015). Springer.
- *Thavaneswaran, A., Appadoo, S. and Peiris S. (2005). Forecasting volatility. Statistics and Probability Letters 75, 1 - 10.*
- *Jon Danielsson (2011). Financial Risk Forecasting. Wiley Finance.* (PPT slides, Ch1,Ch2,Ch4,Ch5,Ch6).
- Creal D, Koopman SJ, Lucas A (2013). Generalized Autoregressive Score Models with Applications. *Journal of Applied Econometrics*, 28(5), 777-795.
- Chan, S., Nadarajah, S. and Afuecheta, E.(2015). An R package for *value at risk and expected shortfall*. *Communications in Statistics-Simulation and Computation* 1532-4141.

Note that these textbooks are provided for extra reference and practice only. Coverage and notation may differ somewhat from the course notes. (Notes may cover topics that are not covered in the textbooks or vice-versa.) **Where there are any discrepancies between the way topics are covered in the course notes and in the textbook, please refer to the course notes.**

Voluntary Withdrawal

The voluntary withdrawal date is **November 19** (by which time you will have received your marks for the term tests).

Academic Dishonesty

It is important that you understand what constitutes academic dishonesty and that you are familiar with the very serious consequences. Links to resources that describe academic

dishonesty (including plagiarism, cheating, inappropriate collaboration and examination impersonation, as well as typical penalties) can be found at:

<http://umanitoba.ca/science/undergrad/resources/webdisciplinedocuments.html>

Copyrighted Material

All course notes, assignments, tests, exams, practice exams and solutions are the intellectual property of your instructor or the Department of Statistics. Reproduction or distribution of these materials is strictly forbidden without their consent.

Recording of Class Lectures

Your instructor and the University of Manitoba hold copyright over the course materials, presentations and lectures which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission from your instructor.

Use of Electronics in the Classroom

It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. A student may use technology in the classroom setting only for educational purposes approved by the instructor and/or the University of Manitoba Accessibility Services. Students should not engage in electronic messaging/posting activities (e-mail, texting, video or voice chat, social networking (e.g. Facebook)) or electronic gaming during scheduled class time.

Class Communication

The University requires all students to activate an official University email account. Please note that all communication between your instructor and you as a student must comply with the Electronic Communication with Students Policy. Please see

http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html

You are required to obtain and use your U of M email account for all communication between yourself and the university.

Student Accessibility Services

If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness,

learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

<http://umanitoba.ca/student/saa/accessibility/>

ROASS Schedule A

Schedule A of the Responsibilities of Academic Staff with regards to Students (ROASS) policies of the University of Manitoba lists resources and policies for students. It is important that you familiarize yourself with these resources and policies. Schedule A will be posted on your instructor's UMLearn page.

Course Outline

This course will cover some topics in time series analysis. After briefly reviewing the standard regression theory, the theory and application of time series techniques will be studied. Topics will be selected from the following list (and with luck, will include them all):

- Fundamental Concepts (Ch. 2)
- Stationary and Non-Stationary Time Series Models (Ch. 3 & 4)
- Forecasting, Model Identification, Parameter Estimation, etc. (Ch. 5, 6 & 7)
- Seasonal Time Series Models (Ch. 8)
- Nonlinear time series models, GARCH Models and GAS models.
- Financial Risk Forecasting and Applications.