

STAT 3490 Section A01  
Time Series Analysis  
Winter 2023

**Time** MWF 8:30 a.m. – 9:20 a.m.,  
EITC E2 Rm350  
**CRN** 50095

**Instructor** Dr A.Thavaneswaran  
326 Machray Hall  
Email:Aearmabamoorthy.Thavaneswaran@umanitoba.ca

**Text1:** Statistical Methods for Forecasting,  
by Abraham, B. and Ledolter, J. (1983). Published by John Wiley.  
**Text2:** FORECASTING : Principles and Practice,  
by R. J. Hyndman and G. Athanasopoulos (2021).Published by otexts,  
3rd Ed.:<https://otexts.com/fpp3>

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

**Office Hours:** MWF 11:30 to 12:00 noon.

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

## Evaluation

Test 1	20%
Test 2	20%
Assignments	20%
Final Examination	40%

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

## Test1 and Test2 Information

Both Midterm tests and final exam will be closed book. A calculator will be required to complete the calculations. All other resources (for example, the textbook), web pages except UM Learn, and communication with other individuals are strictly prohibited. Inappropriate collaboration, plagiarism, or contract cheating of any kind will be dealt with severely and

forwarded to the appropriate disciplinary committee at the University of Manitoba.

The Test 1 will be held on **Monday Feb. 06th (8:30 am to 9:20 am) in class.**

The Test 2 will be held on **Monday March 13th (8:30am to 9:20 am) in class.**

**If there is a need to change any of these tools or instructions, I shall let you know well in advance.**

## Final Exam Information

The final exam will be of two hours in duration and will be scheduled by the Student Records Office. The final exam will cover the whole syllabus.

Should you miss one test, you will be assigned a grade of zero unless you provide valid documentation. The other test and final exam would then be worth 30% and 50%, respectively. Should you miss both tests, you will be assigned a grade of zero unless you provide valid documentation. The final exam would then be worth 80%. **There are no make up tests.** Students who miss both tests, with or without valid documentation, will be reported to the Dean's office as having completed no term tests. This will have repercussions on their ability to write a deferred exam for the course, should such a deferral be requested.

## Assignments

There will be two assignments in this course. Moreover, numerous practice problems (some with solutions) will be uploaded to UM Learn. 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.

- *Statistics and Data Analysis for Financial Engineering with R examples* (Second Edition) by Ruppert, D. and Matteson, D. (2015). Springer.
- *Thavaneswaran A, Paseka A, Frank J. (2019). Generalized Value at Risk Forecasting (May 15, 2019). Communications in Statistics Theory and Methods.*
- *Jon Danielsson (2011). Financial Risk Forecasting. Wiley Finance.* (PPT slides, Ch1,Ch2,Ch4,Ch5,Ch6).

- <https://mspace.lib.umanitoba.ca/handle/1993/36988> (2022 MSc thesis in CS)
- <https://mspace.lib.umanitoba.ca/xmlui/handle/1993/34993> (2020 MSc thesis in Statistics)

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 **March 22nd** (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](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):

- Regression Models and Exponential Smoothing in Forecasting (Ch. 2 &3))
- Stationary and Non-Stationary Time Series Models (Ch. 3 &4)
- ARIMA Models Forecasting, Model Identification, Parameter Estimation, etc. (Ch. 5)

- Seasonal Time Series Models (Ch. 6)
- Financial Risk Forecasting and Applications

## **Appendix For Winter 2023 Course Syllabi (attached)**