University of Wyoming; College of Business
Department of Economics

ECON 4115/5115
Time Series Analysis & Forecasting
Fall 2023

Instructor: Professor David Aadland
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Instructor's In-Person & Zoom Office Hours: MW 11:30 am – 1:00 pm
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Teaching Assistant: Dallas McWhorter
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Class Homepage: https://www.aadecon.com/classes/econ4115/

Course Description: Designed to have an applied orientation in a number of estimation procedures, such as exponential smoothing and forecasting with and without the presence of trends and seasonal repetitive patterns. The Box-Jenkins procedure will be covered in detail. Students become proficient in the application of statistical tools used in time series analysis of economic data.

Course Prerequesites: STAT 3050 or equivalent; STAT 4015/5015 recommended.

Primary Texts: *Forecasting: Principles and Practice* by Rob J Hyndman and George Athanasopoulos (3rd edition; free online https://otexts.com/fpp3/)

Course Requirements:

- Computer Software Packages. We will use R throughout the course.

- Problem Sets. There will be a total of five problem sets, which will be made available on our class webpage. The due date will be clearly printed at the top of each assignment. No late assignments will be accepted. Collaborative work is fine; however, each student is required to write up their own answers.

- Research Project. Each student is required to write a research paper. Additional information about the research project is available on our class website.

- Graduate Student Expectations for ECON 5115. Each problem set will have one additional challenge question that must be answered by graduate students. For the research project, graduate students must include 1) a more thorough literature review

with a minimum of five citations and 2) an econometric analysis to contrast with the time series forecasting model.

Grading: Problem sets and the research project will be weighted as follows:

5 Problem Sets	(100 pts)	50%
Research Paper	(100 pts)	50%
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	(200 pts)	100%

A score of 90% or above guarantees an A; a score between 80-89 guarantees and B; a score of 70-79 guarantees a score of C; etc.

Academic Dishonesty Policy:
UNIREG 802, Revision 2, defines academic dishonesty as "an act attempted or performed which misrepresents one's involvement in an academic task in any way, or permits another student to misrepresent the latter's involvement by assisting the misrepresentation." Academic dishonesty will not be tolerated in this class; any instances will be referred to the university's established procedure for judging such cases, with severe penalties as found appropriate.

Disclaimer:
Subsequent changes may be made to any aspect or detail of this Syllabus if and when necessary. Any changes will be announced in class as soon as practical.

Course Outline (tentative schedule; chapters are from *Forecasting: Principles and Practice*):

Chapter 1. Getting Started
Chapter 2. Time Series Graphics
Chapter 3. Time Series Decomposition
Chapter 4. Time Series Features
Chapter 5. The Forecaster's Toolbox
Chapter 6. Judgmental Forecasts
Chapter 7. Time Series Regression Models
Chapter 8. Exponential Smoothing
Chapter 9. ARIMA Models
Chapter 10. Dynamic Regression Models