ACE Network Subject Guide

Time Series

Semester 2, 2025

Administration and contact details

Host department	School of Mathematical Sciences
Host institution	Macquarie University
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Subject details

Handbook entry URL	TBD
Subject homepage URL	TBD
Honours student hand-out URL	TBD
Teaching period (start and end date):	28 July 2025 - 9 Nov 2025
Exam period (start and end date):	10 Nov 2025 - 28 Nov 2025
Contact hours per week:	2
ACE enrolment closure date:	8/8/25
Lecture day(s) and time(s):	Thurs 12-2pm & 5-6pm AEST
SGTA (Tutorial)	to 6 pm Thursday/ online Office Hour at 5 pm Thursday
Description of electronic access arrangements for students (for example, LMS)	Prolearn

Subject content

1. **Subject content description**

   This unit is an introduction to Time Series Analysis and Forecasting. This unit introduces methods suitable for forecasting including the decomposition of time series, exponential smoothing methods, ARIMA modelling, and regression with autocorrelated disturbances.

2. **Week-by-week topic overview**

1	Introduction
2	Time series graphics
3	Time series decomposition
4	Time series features
5	The forecaster's toolbox
6	Time series regression models
7	Exponential smoothing
8	Exponential smoothing
9	ARIMA models
10	ARIMA models
11	ARIMA models
12	Dynamic Regression models
13	Revision

   This is subject to revision, some topics may be expanded and others condensed.

3. **Assumed prerequisite knowledge and capabilities**

   Knowledge of probability distribution, expectation, conditional expectation, confidence interval, hypothesis testing and perhaps likelihood; familiarity with the R programming language.

4. **Learning outcomes and objectives**
   On successful completion, a student will be able to
   1. provide an understanding of common statistical methods used in forecasting
   2. develop computer skills for forecasting time series data
   3. provide insights into the problems of large scale forecasting systems

5. **Learning resources**
   Rob J Hyndman and George Athanasopoulos (2021) Forecasting: principles and practice, 3rd edition, OTexts: Melbourne, Australia.
   The online version of this book could be found at https://otexts.com/fpp3/

6. Assessment breakdown

Portfolio	25 %
Assignment	25 %
Exam	50 %

Assignment due dates	Exam date (approximate)
Week 8 (Portfolio)	10 Nov 2025 - 28 Nov 2025
Week 12 (Assignment)	

Institution honours program details – To be determined

Weight of subject in total honours assessment at host department	
Thesis/subject split at host department	
Honours grade ranges at host department	
H1	Enter range %
H2a	Enter range %
H2b	Enter range %
H3	Enter range %

Institution masters program details – To be determined

Weight of subject in total masters assessment at host department	
Thesis/subject split at host department	
Masters grade ranges at host department	
H1	Enter range %
H2a	Enter range %
H2b	Enter range %
H3	Enter range %