



**MONASH**  
University

MONASH  
BUSINESS  
SCHOOL

# **ETC3550/ETC5550**

## **Applied forecasting**

# Contact details

## Lecturer

### Professor Rob Hyndman

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- Email: [Rob.Hyndman@monash.edu](mailto:Rob.Hyndman@monash.edu)

## Tutors

- Mitchell O'Hara-Wild
- Hansika Hewamalage
- Ryan Thompson
- Sayani Gupta

## Find me at ...

-  [@robjhyndman](https://twitter.com/robjhyndman)
-  [@robjhyndman](https://github.com/robjhyndman)
-  [robjhyndman.com](http://robjhyndman.com)
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# Brief bio

- Professor of Statistics, Monash University
- Head, Department of Econometrics & Business Statistics
- Editor-in-Chief, *International Journal of Forecasting*, 2005–2018

## How my forecasting methodology is used:

- Pharmaceutical Benefits Scheme
- Cancer incidence and mortality
- Electricity demand
- Ageing population
- Fertilizer sales

[robjhyndman.com](http://robjhyndman.com)

# Unit objectives

- 1 To obtain an understanding of common statistical methods used in business and economic forecasting.
- 2 To develop the computer skills required to forecast business and economic time series data;
- 3 To gain insights into the problems of implementing and operating large scale forecasting systems for use in business.

## Teaching and learning approach

Two 50 minute classes and a one 80 minute computer lab session each week for 12 weeks.



Available for download from CRAN:

<https://cran.csiro.au/>



Available for download from RStudio:

<https://www.rstudio.com/products/rstudio/>

# Key reference

**Hyndman, R. J. & Athanasopoulos, G. (2020)**  
***Forecasting: principles and practice*, 3rd edition**

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**[OTexts.org/fpp3/](https://otexts.org/fpp3/)**

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*Forecasting: principles and practice*, 3rd edition

**[OTexts.org/fpp3/](https://otexts.org/fpp3/)**

- Free and online
- Data sets in associated R packages
- R code for examples



# Main packages



**tsibble**



**tsibbledata**

**tidyverse**

[www.studio.com](http://www.studio.com)



**feasts**



**Fable**

# Main packages

*# Data manipulation and plotting functions*

**library**(tidyverse)

*# Time series manipulation*

**library**(tsibble)

*# Tidy time series data*

**library**(tsibbledata)

*# Time series graphics and statistics*

**library**(feasts)

*# Forecasting functions*

**library**(fable)

# Main packages

*# Data manipulation and plotting functions*

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*# Tidy time series data*

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*# Time series graphics and statistics*

**library**(feasts)

*# Forecasting functions*

**library**(fable)

*# All of the above*

**library**(fpp3)

# Install required packages

```
install.packages(c(  
  "tidyverse",  
  "fpp3"  
))
```

# Outline

Week	Topic	Chapter
1	Introduction to forecasting and R	1
2	Time series graphics	2
3	Time series decomposition	3
4	The forecaster's toolbox	5
5-6	Exponential smoothing	8
7-9	Forecasting with ARIMA models	9
10-11	Multiple regression and forecasting	7
11-12	Dynamic regression	10

# Assessment

- Nine short assignments, worth 2% or 4% each.
- One project due at the end of the semester, worth 20%.
- Exam (2 hours): 60%.

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**ETC5550 students:** in-class exam on 5 June

- Includes all lecture notes, handouts, assignments
- Assignment submissions
- Forum for asking questions, etc.

**Please don't send emails. Use the forum.**

# Exercises Week 1

- Make sure you are familiar with R, RStudio and the tidyverse packages.
- If you've done ETC1010, then you have nothing to do.
- Otherwise:
  - ▶ Read the first four chapters of “ModernDive”: [moderndive.netlify.com](https://moderndive.netlify.com)
  - ▶ Work through the “RYouWithMe” course: [rladiessydney.org/courses/ryouwithme/](https://rladiessydney.org/courses/ryouwithme/)



- The IIF provides a prize to the top student in this subject each year.
- US\$100 plus one year membership.