

# ETC3550/ETC5550

## Applied forecasting



# Contact details

## Lecturer: Professor Rob Hyndman

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## Tutors

- **Mitchell O'Hara-Wild**
- Yashpal Ramakrishnaiah
- Elena Sanina
- Ryan Thompson
- Fin Yang

## 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
- Electricity demand
- Australian tourism demand
- Ageing population
- COVID-19 cases
- > 3 million downloads per year

# 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 lectures and one 80 minute tutorial each week for 12 weeks.



Available for download from CRAN:

<https://cran.r-project.org>

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Available for download from RStudio:

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

## Key reference

Hyndman, R. J. & Athanasopoulos, G. (2021) *Forecasting: principles and practice*, 3rd edition

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

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

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



# Main packages



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```
# 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)
```

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*# Tidy time series data*

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*# Time series graphics and statistics*

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library(feasts)
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*# 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

- 8 or 9 short assignments, worth a total of 20%.
- One project due towards the end of the semester, worth 20%.
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## ETC5550 students:

One assignment different, and extra exam question.

# Moodle site

- Includes all course materials
- 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.
- Do first five chapters of `learnr.numbat.space`.
- Assignment 1

# International Institute of Forecasters



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