MONASH University

MONASH BUSINESS SCHOOL

ETC3550/ETC5550
Applied forecasting

Contact details

Lecturer: Professor Rob Hyndman

rob.hyndman@monash.edu
robjhyndman.com
@robjhyndman
Room E762, Menzies Building

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.

R

Available for download from CRAN:

`https://cran.r-project.org`

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

Key reference

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

OTexts.org/fpp3/

Key reference

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

OTexts.org/fpp3/

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

Main packages

tsibble

tsibbledata

tidyverse

feasts

fable

Main packages

```r
# 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

```r
# 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)
```

```r
# All of the above
library(fpp3)
```

Install required packages

```r
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%.
- Exam (2 hours): 60%.

Assessment

- 8 or 9 short assignments, worth a total of 20%.
- One project due towards the end of the semester, worth 20%.
- Exam (2 hours): 60%.

Task	**Due Date**	**Value**
Assignments	Sun 11:55pm each week	2 or 4% each
Project	Fri 20 May	20%
Final exam	Official exam period	60%

Assessment

- 8 or 9 short assignments, worth a total of 20%.
- One project due towards the end of the semester, worth 20%.
- Exam (2 hours): 60%.

Task	**Due Date**	**Value**
Assignments	Sun 11:55pm each week	2 or 4% each
Project	Fri 20 May	20%
Final exam	Official exam period	60%

- Need at least 45% for exam, and 50% for total.

Assessment

- 8 or 9 short assignments, worth a total of 20%.
- One project due towards the end of the semester, worth 20%.
- Exam (2 hours): 60%.

Task	Due Date	Value
Assignments	Sun 11:55pm each week	2 or 4% each
Project	Fri 20 May	20%
Final exam	Official exam period	60%

- Need at least 45% for exam, and 50% for total.

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.
- If you've done ETC1010 or ETC5010, then you have nothing to do.
- Otherwise:
    - Read the first four chapters of "ModernDive": `moderndive.netlify.com`
    - Work through the "RYouWithMe" course: `rladiessydney.org/courses/ryouwithme/`

International Institute of Forecasters

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