

ST3010 Applied Forecasting [5 credits]

Lecturer(s): Associate Professor Rozenn Dahyot (dahytor@tcd.ie)

Module organisation

The module runs for 12 weeks of the academic year and comprises three lectures per week (except the study week). Total contact time is 33 hours.

| Start Week | End Week | Lectures per week | Lectures total |
|---------------|----------|----------------------|-------------------|
| 1 | 12 | 3 | 33 |

Module description, aims and contribution to programme

The aim of this module is to learn several mathematical techniques to analyse past observations for the purpose of predicting future outcomes and their associated uncertainty. The module will be practical, and will involve every student in extensive analysis of case study materials for a variety of time series data.

Learning outcomes

When students have successfully completed this module they should be able to:

1. Define and describe the different patterns that can be found in times series and propose algorithms and statistical models that are suitable for their analysis.
2. Program, analyse and select the best model for forecasting.
3. Interpret output of data analysis performed by a computer statistics package.
4. Compute predictions with their confidence intervals using the selected model.

Module content

Introduction to forecasting; ARIMA models, GARCH models, Kalman Filters, data transformations, seasonality, exponential smoothing and Holt Winters algorithms, performance measures. Use of transformations and differences.

Assessment

Exam: 100% work.

Required textbook

Forecasting - Methods and Applications, S. Makridakis, S. C. Wheelwright and R. J. Hyndman, Wiley

Forecasting: principles and practice, <https://www.otexts.org/fpp/>

Module Pre requisite

Basic Statistics and Mathematics

Further information

N/a