# Course information 2020-21
# ST2187 Business analytics, applied modelling and prediction

## General information

**COURSE LEVEL:** 5

**CREDIT:** 30

**NOTIONAL STUDY TIME:** 300 hours

## Summary

People in business, economics and the social sciences are increasingly aware of the need to be able to handle a range of mathematical and statistical models. It must be admitted that many good managers are not very mathematically adept. However, they would be even more inquisitive, more precise, more accurate in their statements, more selective in their use of data, more critical of advice given to them etc. if they had a better grasp of quantitative subjects. Modelling is an important tool which all good managers should appreciate. The course extends and reinforces existing knowledge and introduces new areas of interest and applications of modelling in the ever-widening field of management.

## Conditions

**Prerequisites:** If taken as part of a BSc degree, the following courses must be passed before this course may be attempted:

- ST104a Statistics 1
- **AND** ST104b Statistics 2
- **AND EITHER** MT105a Mathematics 1 **OR** MT1174 Calculus **OR** MT1186 Mathematical methods

Students also require access to Microsoft Excel and Tableau.

## Aims and objectives

The objectives specifically include:

- the mechanics of building applied business models
- managerial decision making
- producing and critiquing forecasts.

## Learning outcomes

At the end of the course and having completed the essential reading and activities students should be able to:

- apply modelling at varying levels to aid decision-making

Please consult the current EMFSS Programme Regulations for further information on the availability of a course, where it can be placed on your programme's structure, and other important details.

- understand basic principles of how to analyse complex multivariate datasets with the aim of extracting the important message contained within the large amount of data which is often available
- demonstrate the wide applicability of mathematical models while, at the same time, identifying their limitations and possible misuse.

## Essential reading

Albright, S. and W. Winston Business Analytics: Data Analysis and Decision Making, (South-Western, 2016) sixth edition [ISBN 9781305947542].

## Assessment

This course is assessed by an individual case study piece of coursework (30%) and a two hour unseen written examination (70%).

## Syllabus

Topics to be covered each week:

1. Decision-making under uncertainty and modelling.
2. Univariate data visualisation and descriptive statistics.
3. Exploring relationships between variables.
4. Tableau orientation.
5. Probability and probability distributions.
6. Common probability distributions in business applications.
7. Decision-making under uncertainty using decision trees.
8. Sampling and sampling distributions.
9. Confidence interval estimation.
10. Hypothesis testing.
11. Regression analysis - estimating relationships.
12. Regression analysis - statistical inference.
13. Time series analysis and forecasting.
14. Optimisation models.
15. Monte Carlo simulation models.