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.

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

ST104A Statistics 1 and either:
MT105A Mathematics 1
or MT1174 Calculus.

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.

Essential reading

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
✔️ 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.

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

Students should consult the appropriate EMFSS Programme Regulations, which are reviewed on an annual basis. The Regulations provide information on the availability of a course, where it can be placed on your programme’s structure, and details of co-requisites and prerequisites.
Syllabus
This is a description of the material to be examined. On registration, students will receive access to the online course, which provides a framework for covering the topics in the syllabus and directions to the essential reading.

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.
7. Decision-making under uncertainty using decision trees.
8. Sampling and sampling distributions.
10. Hypothesis testing.
11. Regression analysis - estimating relationships.
12. Regression analysis - statistical inference.
13. Time series analysis and forecasting.
15. Monte Carlo simulation models.