Module Details

Module Code
ST4004

Module Name
MANAGEMENT SCIENCE IN PRACTICE

Module Short Title

ECTS weighting
10

Semester/term taught
Michaelmas Term

Contact Hours
6 hours lectures and computer laboratories per week.

Module Personnel
Lecturing staff: Brett Houlding & Arthur White

Learning Outcomes
After this course, students will be able to

- Implement various management science techniques in Excel, recognising its abilities and limitations;
- Identify when an optimisation problem can be solved using dynamic programming and implement the dynamic programming solution;
- Demonstrate that decreasing marginal worth leads to risk averse behaviour;
- Calculate the risk premium for an given insurance contract and utility of money;
- Compare and contrast the properties of futures and options contracts;
- Create investment strategies using options based on opinions about price movements over the term of the option;
• Identify the impact of correlation between parameters on results of a model;
• Quantify the size of Monte Carlo error having carried out a simulation list tests that can be carried out on a sequence of random numbers;
• Generate deviates from an arbitrary pdf;
• Understand mathematical solutions to bargaining problems and two person game problems;
• Options and limitations of social welfare functions.

Module Learning Aims

This course will look into some of the topics covered in the earlier management science courses at greater depth, with emphasis on how the methods can be practically implemented, principally through Excel.

Module Content

• Risk Management;
• Simulation in complex modelling;
• Parametric elicitation;
• Supply Chain Management;
• Multi-objective, Multi-Criteria decision making;
• CPM and PERT analysis
• Stochastic linear programming;
• Decision theory;
• Dynamic programming;
• Utility of money;
• Futures and options;
• Bargaining theory and game theory.

Recommended Reading List

• Making Hard Decisions with Decision Tools, 3rd Edition. Clemen and Reilly
• Making Decisions. Lindley.
• Discrete-Event System Simulation. J. Banks et al.
Module Pre Requisite

ST2006 Management Science Methods.

Module Co Requisite

Assessment Details

Assessment is by written examination. To pass the module, students must achieve an overall mark of 40%.

Module Website

https://www.scss.tcd.ie/~arwhite/Teaching/ST4004.html

Module approval date

Approved By

Academic Start Year

Academic Year of Data

2016/17