Module Details for ST2006 MANAGEMENT SCIENCE METHODS

**Current Record**

Module Details

**Module Code** ST2006

**Module Name** ST2006 MANAGEMENT SCIENCE METHODS

**ECTS** 10

**Semester/term taught** Semester 1 and 2

**Contact Hours** 2 hours lectures in both Semester 1 and 2 with weekly assignments in Semester 1 and 1 hour lab per week for Semester 2

**Module Personnel** Assistant Professor Mary Sharp and Assistant Lecturer Brett Houlding

**Learning Outcomes**

By the end of Semester 1 students should be able to:

- Identify an infeasible problem, a problem with multiple solutions or the presence of degeneracy

- Describe how to find an initial basic feasible solution to a linear program

- Conduct a parametric analysis on a coefficient in the objective function
• Define and formulate a balanced transportation problem and solve

• Describe how to solve integer programs with a branch and bound algorithm

• Formulate a 0–1 integer program, put into standard form and solve with a branch and bound algorithm

By the end of Semester 2 students should be able to:

• the concepts and terminology involved in Simulation;

• different kinds of simulation techniques;

• how and when it is used and be familiar with a range of application examples;

• how to apply a simulation using appropriate software;

• its limitations
This course is based on developing and solving mathematical models of real life problems.

The students receive a theoretical introduction to the fundamental elements of a mathematical model. Modelling techniques are taught to solve problems in many domains.

Semester 2: Introduction to Simulation

To introduce the concepts, ideas and techniques involved in Simulation.

**Module** Semester 1

**Content**

- Formulate and solve Linear and Goal Programming problems using the Simplex Method

- Perform Sensitivity Analysis on the output from a Linear and Goal Programming problem

- Formulate and solve Transportation, Transhipment and Assignment problems

- Formulate a 0 – 1 Linear Programming problem and solve using the Cutting Plane and Branch and Bound Methods

- Analyse networks for the Chinese Postman and Travelling Salesman Problems

- Other relevant mathematical models
Semester 2

Specific topics addressed in this module include:

• Entities, attributes and variables;

• Events;

• Resources;

• Queues;

• Steady-state models and transients;

• Software for simulation;

• Statistical analysis of output;

**Recommended Reading List**

There is no set Bibliography for Semester 1. Advice as to course texts will be given in class.

Semester 2


Module Pre Requisite

Module Co Requisite

Assessment Details 20% Course work and 80% Examination (3 hours)

Module Website

Module approval date

Approved By

Academic Start Year

Academic Year of Data