

ES965-10 Problem Solving with Statistics

20/21

Department

WMG

Level

Taught Postgraduate Level

Module leader

Jane Marshall

Credit value

10

Module duration

1 week

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

Many businesses and the sub-systems or processes on which they depend are the focus of "Continuous Improvement". Once the obvious changes have been completed it becomes increasingly difficult to identify a path which can lead to better performance, whether this involves progressing from Good to Excellent, from Acceptable to Good, or from Unacceptable to Acceptable. There are many tools and techniques which can be used to aid this quest, including those that have a basis in statistics.

This module describes the general context in which statistical techniques are appropriate, and when they are not. It indicates the basis of statistics as a means of modelling the system under consideration, and describes some of the tools for investigating processes, either to solve specific problems or to gain insights to support future development and improvement.

Module aims

To gain experience and understanding of the following:

The development of Statistical models to represent "real life" systems.

The use of Statistical models in Problem Solving and Decision Making.

The relationship between Statistical methods and other Problem Solving techniques.
The extension of basic tools into more powerful techniques.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Statistical models and "real world" systems.
Statistical Distributions (Continuous and Discrete).
Exploratory Data Analysis.
Sampling and Inference
Regression and Correlation
Introduction to Decision Analysis
Design of experiments.
Model Building.

Learning outcomes

By the end of the module, students should be able to:

- Understand and use statistical models in problem solving and decision making.
- Comprehensively understand the relationship between statistical methods and other problem solving techniques.
- Interpret the results of statistical analysis and apply that to real world problems.
- To critically evaluate the use of statistical models used to represent "real life" systems.
- To develop statistical models to represent "real life" systems.
- To be able to extend basic tools into more powerful techniques.

Indicative reading list

Data analysis with Microsoft Excel , Berk, Kenneth N.; Carey, Patrick
c2000 Duxbury Press 0534362788

Design and analysis of experiments, Montgomery, Douglas C. ,
2013, John Wiley & Sons, Inc 1118146921

Engineering statistics Montgomery, Douglas C.; Runger, George C.; Hubele, Norma Faris
2007 John Wiley 0471735574

[View reading list on Talis Aspire](#)

Subject specific skills

Analysis, Modeling, use of software to support decision making.

Transferable skills

Communication, organization, teamwork,

Study

Study time

Type	Required
Lectures	22 sessions of 1 hour 30 minutes (33%)
Seminars	6 sessions of 1 hour 30 minutes (9%)
Assessment	58 hours (58%)
Total	100 hours

Private study description

No private study requirements defined for this module.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A1

Weighting Study time Eligible for self-certification

Assessment component

Assessed work as specified by department	100%	58 hours	Yes (extension)
Departmental defined essay			

Reassessment component is the same

Feedback on assessment

Written feedback.

Availability

Pre-requisites

Courses

This module is Core optional for:

- Year 1 of TESA-H7Q0 Postgraduate Taught Manufacturing Systems Engineering & Management
- Year 1 of TESS-H7Q5 Postgraduate Taught Manufacturing Systems Engineering & Management (HKPU)

This module is Optional for:

- Year 1 of TESS-H7Q1 Postgraduate Taught Manufacturing Systems Engineering & Management

This module is Core option list C for:

- Year 1 of TWMS-H7BG Postgraduate Supply Chain and Logistics Management (awarded jointly with Hong Kong Polytechnic University)
- Year 1 of TESS-H7PE Postgraduate Taught Supply Chain and Logistics Management (Overseas and Self-Financing)

This module is Option list A for:

- Year 1 of TESS-H1PU Postgraduate Taught International Technology Management

This module is Option list B for:

- Year 1 of TESS-H1P2 Postgraduate Award in Engineering Business Management
- Year 1 of TESA-H1P7 Postgraduate Taught Engineering Business Management
- Year 1 of TESS-H1P1 Postgraduate Taught Engineering Business Management

This module is Option list C for:

- Year 1 of TWMA-H1NB Postgraduate International Trade, Strategy and Operations
- Year 1 of TESA-H7PD Postgraduate Taught Supply Chain and Logistics Management (Home Fees)