

# ES965-10 Problem Solving with Statistics

**21/22**

**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

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## 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,

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## 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.

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## Assessment

You must pass all assessment components to pass the module.

### Assessment group A1

	Weighting	Study time
Assessed work as specified by department	100%	58 hours
Departmental defined essay		

### Feedback on assessment

Written feedback.

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## 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)