Statistical Modelling

Module Information

2022.01, Approved

Summary Information

Module Code	5101STATS
Formal Module Title	Statistical Modelling
Owning School	Computer Science and Mathematics
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Computer Science and Mathematics

Learning Methods

Learning Method Type	Hours
Lecture	20
Practical	15
Tutorial	20

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-CTY	CTY	September	12 Weeks

Aims and Outcomes

Aims	To enable the students to understand and use simple and multiple linear regression models.To enable the students to understand and use one-way and two-way Analysis of Variance models.To give the students an overview of the statistical modelling process.To extend the students' knowledge and understanding of linear statistical models.To introduce the students to basic ideas of experimental design.To give the students experience of using statistical models in practice.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Use simple and multiple linear regression models.
MLO2	2	Use one-way and two-way Analysis of Variance models.
MLO3	3	Explore linear models using statistical software.
MLO4	4	Use blocking techniques to reduce residual variation.
MLO5	5	Use appropriately Latin Square and factorial designs.
MLO6	6	Analyse data arising from an experimental situation using statistical software.

Module Content

Outline Syllabus	Simple linear regression - ordinary least squares estimation, the analysis of variance, confidence intervals and tests, residuals, prediction.Multiple linear regression - regression in matrix notation, general F testing, model selection, residuals, prediction.Statistical software, for simple and multiple linear regression.One-way Analysis of Variance - least squares estimation, subsidiary analyses.Two-way Analysis of Variance - additive model, model with interaction effects, subsidiary analyses.Statistical software, for one and two-way Analysis of Variance.Sources of variation - randomised blocks experimental designs.Examples from business, science and the social sciences.Overview of the statistical modelling process.Regression diagnostics - residuals, outliers, influence of cases, non-constant variance, non linearity.Generalized Linear Models.Model building - polynomial regression, comparing regression lines, variable selection.
Module Overview	This module covers simple and multiple linear regression, basic one and two-way Analysis of Variance models, and the process of statistical modelling.
Additional Information	This model covers simple and multiple linear regression, basic one and two-way Analysis of Variance models, and the process of statistical modelling.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Portfolio	Portfolio	40	0	MLO3, MLO6
Centralised Exam	Examination	60	2	MLO2, MLO4, MLO5, MLO1

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Gabriela Czanner	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings