Statistical Data Analysis

Module Information

2022.01, Approved

Summary Information

Module Code	7502BDSA
Formal Module Title	Statistical Data Analysis
Owning School	Computer Science and Mathematics
Career	Postgraduate Taught
Credits	20
Academic level	FHEQ Level 7
Grading Schema	50

Teaching Responsibility

LJMU Schools involved in Delivery
Computer Science and Mathematics

Learning Methods

Learning Method Type	Hours
Lecture	45
Practical	30

Module Offering(s)

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

Aims and Outcomes

Aims	The course covers the concept, the underlying assumptions, and the applications of generalized linear model (GLM) and growth curves. It considers detecting and handling influential observations. The course provides students with a comprehensive knowledge about matrix representation of a model, model fit, model validation, interpretation and prediction for future observations. The course covers the experimental design and analysis, the analysis of variance (ANOVA), logistic regression, and the analysis of multidimensional contingency tables. The students will have hands-on practice using R/SPSS (or alternative recent software) as analytic tools to analyse real-world data by implementing the course topics.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Model relationships between variables using regression analysis, classification and non-parametric methods.
MLO2	2	Implement different resampling methods for model assessment, model selection, and uncertainty measurement.
MLO3	3	Control prediction variance using subset selection, shrinkage, and dimension reduction methods.
MLO4	4	Implement tree-based methods for decision-making problems.
MLO5	5	Analyse real data using advanced statistical programming software.

Module Content

Outline Syllabus	Statistical LearningLinear RegressionClassification.Resampling MethodsLinear Model Selection and RegularizationMoving Beyond LinearityTree-Based Methods
Module Overview	
Additional Information	The module contributes to the master's aim to equip the student with the required abilities and skills to perform data science on real-world applications.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Portfolio	Assignments/Exercises	30	0	MLO1, MLO2, MLO3
Report	Report & Presentation	30	0	MLO1, MLO2, MLO3, MLO4, MLO5
Exam	Final Examination	40	3	MLO1, MLO2, MLO3, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Sandra Ortega Martorell	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings