

Linear statistical modelling (M346) content listing

Unit 1 <i>Introduction and Review of statistical concepts</i>	Definition of linearity, revision of the statistical prerequisites required for the module.
Unit 2 <i>Introduction to GenStat</i>	Introduction to the software used in this module, GenStat. This includes producing basic graphical output, numerical summaries and calculations of quantiles and probabilities from standard distributions.
Unit 3 <i>Simple linear regression</i>	Simple linear regression including fitting using GenStat, making inferences, calculating confidence and prediction intervals, transformations, comparing slopes and correlations.
Unit 4 <i>One-way analysis of variance</i>	Completely randomized experiments, description of the one-way ANOVA model, testing for equality of means, planned comparisons, contrasts and unplanned comparisons.
Unit 5 <i>Multiple linear regression</i>	Description of the multiple linear regression model, choosing explanatory variables, stepwise regression, parallels with cases with one explanatory variable, using indicator variables to compare regression lines and to do analysis of variance.
Unit 6 <i>Analysis of factorial experiments</i>	Main effects and interactions, two-way ANOVA, more than two factors, using regression, factorial ANOVA without replication.
Unit 7 <i>Experiments with blocking</i>	Description of blocking, Latin squares, incomplete block designs, split plot designs, confounding, designing experiments.
Unit 8 <i>Binary regression</i>	The logistic function, the logistic regression model, using logistic regression.
Unit 9 <i>What are generalised linear models?</i>	Poisson regression, the generalized linear model, inference for GLMs, GLM applications.
Unit 10 <i>Diagnostic checking</i>	Leverage, the Cook statistic, residuals for GLMs, detection of observations with high leverage or influence in GLMs and recommended use of diagnostics.
Unit 11 <i>Loglinear models for contingency tables</i>	Two-way contingency tables, sampling models, loglinear models in practice, links between logistic and loglinear models.
Unit 12 <i>Further data analyses</i>	Data analysis involving GLMs, analysis of covariance, offsets, overdispersion.