

# Course Module Information

## ST312: Applied Statistics II

### Semester 2 | Credits: 5

Methods and applications in applied statistical inference. This module discusses factors for consideration in experiment design and demonstrates methods in the analysis of data emerging from designed experiments. Topics covered include confounding, blocking, a completely randomized design and a randomized block design, two-way ANOVA. The module also demonstrates regression modelling for a qualitative response, i.e. methods in binomial/logistic regression and generalized linear models. Various techniques for analysing multivariate responses will be covered, including principal components analysis and cluster analysis.

(Language of instruction: English)

### Learning Outcomes

1. discuss topics in experiment design and carry out analysis for data collected from a completely randomized design, a randomized block design, and two-factor studies with interaction effects, interpret the results with reference to the data application;
2. formulate a logistic regression model and generalized linear model for a qualitative response, calculate and interpret estimated coefficients and make statistical inferences on the fitted model by carrying out statistical tests using parameter estimates, obtain fitted values and predictions at new data points, together with associated prediction and confidence intervals;
3. apply various techniques in analysis of a multivariate response, including topics from, principal components analysis, cluster analysis.
4. carry out analysis and testing procedures discussed with the use of software, R;
5. compile a statistical report, i.e. prepare a typed document which introduces the statistical research question being explored, describes the data collection method applicable to the research, describes relevant features of the sample data obtained, and outlines conclusions from inferential statistical analysis carried out using the sample data, incorporating output and plots from statistical software.

### Assessments

- Written Assessment (70%)
- Continuous Assessment (30%)

## **Module Director**

- NICOLA FITZ-SIMON: [Research Profile](#) | [Email](#)

## **Reading List**

1. "Applied Linear Regression Models" by Kutner, Nachtsheim & Neter  
Publisher: McGraw Hill