

Module code

SPM-3408

Type of module

Undergraduate: Mathematical Sciences – Elective

Applied Statistics



Modular credits

4

Total student
engagement

56 hours

Prerequisite

**SPM-2203 Probability
and Statistics**

Anti-requisite

None

Aims

To develop students' ability to apply advanced statistical methods to complex data in real-world contexts. Students learn to frame research questions, choose appropriate techniques, recognise assumptions and limitations, use statistical software effectively, and present findings clearly to specialist and non-specialist audiences.

Module learning outcomes (MLO)

On successful completion of this module, a student will be expected to be able to:

MLO 1

Analyse univariate and multivariate data using advanced statistical methods.

MLO 2

Interpret the results of statistical analyses and construct clear, concise reports for effective communication.

MLO 3

Evaluate the suitability of different analytical approaches for given research or practical problems.

MLO 4

Evaluate and demonstrate effective collaboration in teams and the ability to work independently on data-driven tasks.

MLO 5

Apply statistical software and computational tools to design solutions for real-world data problems.

Module contents

Multivariate data: Exploratory data analysis, handling missing data

Advanced regression and GLMs: Multiple regression, logistic regression, multinomial regression

ANOVA, ANCOVA and Multivariate Inference: One-way, two-way, covariate adjustments, MANOVA, MANCOVA

Data reduction: Factor analysis (FA), Principal Component Analysis (PCA)

Longitudinal data analysis: Repeated measures, random effects

Survival analysis: Kaplan-Meier, Log-rank test

Communication and reporting: Presenting applied results, reproducibility, communication with non-statistical researchers

Assessment

60%

Examination

40%

Coursework

Examination
60%

Class tests
30%

10%

Examination — 60% **Class tests — 30%** **Assignment — 10%**

Formative assessment	Summative assessment	
Weekly discussion and feedback	COMPONENT	WEIGHTING
	Examination	60%
	Coursework	40%
	Individual	40%
	Class tests	30%
	Assignment	10%

Graduate attributes and skills

Programme learning objectives (PLO) addressed

1	PLO 1 (Core Mathematical Knowledge)	2	PLO 2 (Analytical Problem-Solving)
3	PLO 3 (Computational and Digital Tools)	4	PLO 4 (Mathematical Communication)
5	PLO 5 (Collaboration, Project Management and Industry Engagement)		

Sustainability concept addressed

3	SDG 3 Good Health and Well-Being
4	SDG 4 Quality Education
9	SDG 9 Industry, Innovation and Infrastructure

Digital skills/software used (not limited to)

Learning management and collaboration platforms (e.g. Canvas)
Statistical computing and programming software

Micro-credentialling option No	Stackable towards GenBESTARI Undergraduate Degree Programme or other relevant Lifelong Learning Programmes No
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Document details

Office	ODVCE	Document date	27 June 2026	Status	New	Approval	GBF (12/02/2026)
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