**COURSE DETAILS**

**Course Code:** F21SA  
**Full Course Title:** Statistical Modelling and Analysis  
**SCQF Level:** 11  
**SCAF Credits:** 15  
**Available as Elective:** No

**DELIVERY LEVEL**

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Additional Information:

**COURSE AIMS**

The aim of this course is to learn and apply a range of Statistical Modelling and Analysis techniques applicable for data analysis.

**LEARNING OUTCOMES – SUBJECT MASTERY**

- Detailed and critical understanding of the concepts, issues, principles and theories of statistical modelling and analysis.  
- Critical theoretical and detailed practical knowledge of statistical modelling and analysis techniques.  
- Practical professional experience of analysing, designing, implementing and validating experiments using common statistical techniques.

**LEARNING OUTCOMES – PERSONAL ABILITIES**

- Ability to deal with complex issues and make informed professional judgements about statistical models and analysis.  
- Exercise substantial autonomy and initiative in performing data analysis.  
- Showing initiative and good professional team working skills in shared data analysis. (PDP)  
- Demonstrate critical reflection on statistical modelling and analysis issues. (PDP)

**SYLLABUS**

A practical understanding of:

- Basic probability concepts: Random variables and their distributions; how distributions relate to sampling scenarios.  
- Joint distributions, Sums of random variables, Central limit theorems.
F21SA Statistical Modelling and Analysis

- Classical inference: Point estimation, moment estimators and maximum likelihood; Confidence intervals – calculation and interpretation; Hypothesis testing and p-values
- Essentials of Bayesian inference: Priors and posteriors; Credible intervals; Predictive distributions
- Modelling approaches: Regression and ANOVA;
- Multivariate exploratory techniques: Principal Components Analysis + Factor Analysis; Introduction to non-parametric methods
- Practical elements in R or Python

COURSE RELATIONSHIPS
N/A

LOCATION AND ASSESSMENT METHODS

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