COURSE DETAILS
Course Code: F20SA
Full Course Title: Statistical Modelling and Analysis
SCQF Level: 10
SCAF Credits: 15
Available as Elective: No

DELIVERY LEVEL
Undergraduate: Yes  Postgraduate Taught: No  Postgraduate Research: No

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 understanding of the concepts, issues, principles and theories of statistical modelling and analysis
- Understanding and practical knowledge of statistical modelling and analysis techniques to apply suitable methodologies for a given task
- Practical experience of analysing, designing, implementing and validating experiments using common statistical techniques.

LEARNING OUTCOMES – PERSONAL ABILITIES

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

SYLLABUS
A practical understanding of:
F20SA Statistical Modelling and Analysis

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

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<th>Course Code</th>
<th>Level</th>
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<th>School</th>
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<td>F17SC</td>
<td>7</td>
<td>Discrete Mathematics</td>
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### LOCATION AND ASSESSMENT METHODS

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