COURSE DETAILS

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

DELIVERY LEVEL

<table>
<thead>
<tr>
<th>Undergraduate</th>
<th>No</th>
<th>Postgraduate Taught</th>
<th>Yes</th>
<th>Postgraduate Research</th>
<th>No</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>COURSE RELATIONSHIPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOCATION AND ASSESSMENT METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edi</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>Y</td>
</tr>
<tr>
<td>Y</td>
</tr>
<tr>
<td>Y</td>
</tr>
</tbody>
</table>