### COURSE DETAILS

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

### DELIVERY LEVEL

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

### 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:
- 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

N/A

### LOCATION AND ASSESSMENT METHODS

<table>
<thead>
<tr>
<th>Edi</th>
<th>SBC</th>
<th>Ork</th>
<th>Dub</th>
<th>Malay</th>
<th>IDL</th>
<th>COLL</th>
<th>ALP</th>
<th>OTH</th>
<th>Method</th>
<th>Weight</th>
<th>Exam Mins</th>
<th>Type</th>
<th>Diet</th>
<th>Synoptic Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Examination</td>
<td>70</td>
<td>120</td>
<td>Assessment</td>
<td>Semester 1</td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td></td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coursework</td>
<td>30</td>
<td></td>
<td>Assessment</td>
<td>Semester 1</td>
<td></td>
</tr>
</tbody>
</table>