1. **Title of the module**

MAST0025 – Foundation Statistics

1. **School or partner institution which will be responsible for management of the module**

School of Mathematics, Statistics and Actuarial Science

1. **The level of the module (e.g. Level 4, Level 5, Level 6 or Level 7)**

Level 3

1. **The number of credits and the ECTS value which the module represents**

15 (ECTS 7.5)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Autumn & Spring

1. **Prerequisite and co-requisite modules**

Pre-requisite: Have studied the equivalent of first year A-level Mathematics

Co-requisite: None

1. **The programmes of study to which the module contributes**

BSc Mathematics with a Foundation Year, BSc Actuarial Science with a Foundation Year, BSc Data Science with a Foundation Year.

1. **The intended subject specific learning outcomes.**

**On successfully completing the module students will be able to:**

1. demonstrate understanding of the basic body of knowledge associated with elementary probability and statistics;
   1. demonstrate the capability to solve problems in accordance with the basic theories and concepts in the following areas, whilst demonstrating a reasonable level of skill in calculation and manipulation of the material: interpretation of data, conditional probability, discrete and continuous probability distributions, hypothesis testing and confidence intervals;
   2. apply the basic techniques associated with hypothesis testing and confidence intervals in several well-defined contexts;
   3. make appropriate use of Excel;
   4. demonstrate a proficiency in probability and statistics suitable for Stage 1 entry.
2. **The intended generic learning outcomes.**

**On successfully completing the module students will be able to:**

Demonstrate an increased ability to:

* 1. manage their own learning and make use of appropriate resources;
  2. understand logical arguments, identifying the assumptions made and the conclusions drawn;
  3. communicate straightforward arguments and conclusions reasonably accurately and clearly;
  4. manage their time and use their organisational skills to plan and implement efficient and effective modes of working;
  5. solve problems relating to qualitative and quantitative information;
  6. make use of information technology skills such as spreadsheet use, online resources (Moodle), internet communication.
  7. demonstrate an increased level of skill in numeracy and computation.

1. **A synopsis of the curriculum**

Statistical techniques are a fundamental tool in being able to measure, analyse and communicate information about sets of data. Using illustrative data sets we show how statistics can be indispensable in applied sciences and other quantitative areas. This module covers the basic methods used in probability and statistics using Excel for larger data sets. A more detailed indication of the module content follows.

Sampling from populations. Data handling and analysis using Excel. Graphical representation for the interpretation of univariate and bivariate data; outliers. Sample summary statistics: mean, variance, standard deviation, median, quartiles, inter-quartile range, correlation. Probability: combinatorics, conditional probability, Bayes’ Theorem. Random variables: discrete, continuous; expectation, variance, standard deviation. Discrete and continuous distributions: Binomial, discrete uniform, Normal, uniform. Sampling distributions for the mean and proportion. Hypothesis testing: one sample, mean of Normal with known variance and proportion, 1- and 2-tail. Confidence intervals: one sample, mean of Normal with known variance and population proportion.

1. **Reading List (Indicative list, current at time of publication. Reading lists will be published annually)**

Understandable statistics: concepts and methods**,** Brase, C.H. and Brase, C.P., Brooks/Cole, 2017, ISBN 9781337119917

Statistics with Microsoft Excel, Fourth edition, Dretzke, B.J., Pearson/Prentice Hall, 2009, ISBN 9780136043874

1. **Learning and Teaching methods**

Total contact hours: 48

Private study hours: 102

Total study hours: 150

1. **Assessment methods.**

13.1 Main Assessment Methods

Assessment 1 Exercises, requiring on average between 5 and 7 hours to complete 5%

Assessment 2 Exercises, requiring on average between 5 and 7 hours to complete 5%

Assessment 3 Exercises, requiring on average between 5 and 7 hours to complete 5%

Assessment 4 Exercises, requiring on average between 5 and 7 hours to complete 5%

Examination 2 hours 80%

The coursework mark alone will not be sufficient to demonstrate the student’s level of achievement on the module.

13.2 Reassessment Methods

Like-for-like

1. ***Map of Module Learning Outcomes (sections 8 & 9) to Learning and Teaching Methods (section12) and methods of Assessment (section 13)***

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 | 9.6 | 9.7 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |  |  |
| Private Study | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Lectures/example classes | **X** | **X** | **X** |  | **X** |  | **X** | **X** |  | **X** |  | **X** |
| Computer classes | **X** | **X** | **X** | **X** | **X** |  | **X** | **X** |  | **X** | **X** | **X** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |  |
| Examination | **X** | **X** | **X** |  | **X** |  | **X** | **X** | **X** | **X** |  | **X** |
| Coursework | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |

1. **Inclusive module design**

The School recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services. The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods.

1. **Campus(es) or Centre(s) where module will be delivered:**

Canterbury

1. **Internationalisation**

Statistics as a branch of mathematics is an international language with techniques developed and refined by statisticians across the globe. Mastery of the subject-specific learning outcomes, 8.1 to 8.3, will equip students to apply the theories and techniques of this module in a wide range of international contexts. The module team is drawn from the School of Mathematics, Statistics and Actuarial Science, which includes many members of staff with international experience of teaching and research collaboration.

In compiling the reading list, consideration has been given to the range of texts that are available internationally and a selection of texts has been identified to complement the delivery of the material.

Examples with an international dimension are included in the module where appropriate.

The support SMSAS provides to its students is also internationally attuned given our international student body.

**DIVISIONAL OFFICE USE ONLY**

**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
|  |  |  |  |  |
|  |  |  |  |  |