UNIVERSITY OF LONDON | INTERNATIONAL PROGRAMMES

Course information 2018–19
ST2133 Advanced statistics: distribution theory (half course)

This half-course is intended for students who already have some grounding in statistics. It provides the basis for an advanced course in statistical inference.

Prerequisites

If taken as part of a BSc degree, the following courses must be passed before this half course may be attempted:

(ST104a Statistics 1 **and** *ST104b Statistics 2)* **and** *(MT1174 Calculus* **or** *(MT105a Mathematics 1* **and** *MT105b Mathematics 2)* **or** *MT1186 Mathematical Methods)*

Aims and objectives

The aim of this course is to provide a thorough theoretical grounding in probability distributions.

The course teaches fundamental material that is required for specialised courses in statistics, actuarial science and econometrics.

Assessment

This half course is assessed by a two-hour unseen written examination.

Learning outcomes

At the end of this half course and having completed the essential reading and activities students should be able to:

- ☑ recall a large number of distributions and be a competent user of their mass/density and distribution functions and moment generating functions
- ☑ explain relationships between variables, conditioning, independence and correlation
- ☑ relate the theory and method taught in the unit to solve practical problems.

Essential reading

For full details, please refer to the reading list

Grimmett, G. and D. Stirzaker *Probability and Random Processes*. (OUP)

Casella, G. and R.L. Berger *Statistical Inference*. (Duxbury)

Syllabus

This is a description of the material to be examined. On registration, students will receive a detailed subject guide which provides a framework for covering the topics in the syllabus and directions to the essential reading

Probability: Probability measure. Conditional probability. Bayes' theorem.
Distribution Theory: Distribution function. Mass and density. Expectation operator. Moments, moment generating functions, cumulant generating functions. Convergence concepts
Multivariate Distributions: Joint distributions. Conditional distributions, conditional moments. Functions of random variables.

Students should consult the appropriate *EMFSS Programme Regulations*, which are reviewed on an annual basis. The *Regulations* provide information on the availability of a course, where it can be placed on your programme's structure, and details of co-requisites and prerequisites.