Statistical Inference (STAT0008)

Description
This module aims to provide a grounding in the theoretical foundations of statistical inference and, in particular, to introduce the theory underlying statistical estimation and hypothesis testing. It is primarily intended for third and fourth year undergraduate students and taught postgraduate students registered on the degree programmes offered by the Department of Statistical Science, or jointly with other departments.

On successful completion of the module, a student should be able to: describe the principal features of, and differences between, frequentist, likelihood and Bayesian inference; define and derive the likelihood function based on data from a parametric statistical model, and describe its role in various forms of inference; define a sufficient statistic; describe, calculate and apply methods of identifying a sufficient statistic; define, derive and apply frequentist criteria for evaluating and comparing estimators; describe, derive and apply lower bounds for the variance of an unbiased estimator; define and derive the maximum likelihood estimate, and the observed and expected information; describe, derive and apply the asymptotic distributions of the maximum likelihood estimator and related quantities; conduct Bayesian analyses of simple problems using conjugate prior distributions, and asymptotic Bayesian analyses of more general problems; define, derive and apply the error probabilities of a test between two simple hypotheses; define and conduct a likelihood ratio test; state and apply the Neyman-Pearson lemma.

Key information

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<th>Year</th>
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<td>Credit value</td>
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<tr>
<td>Tutor</td>
<td>Dr Aidan O’Keeffe</td>
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<tr>
<td>Term</td>
<td>Term 1</td>
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Assessment
- Written examination (main exam period): 90%
- Coursework: 10%

Find out more
For more information about the department, programmes, relevant open days and to browse other modules, visit ucl.ac.uk

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- Reading List: View on UCL website
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