Course information 2020-21
ST104a Statistics 1 (half course)

General information

MODULE LEVEL: 5

CREDIT: 30

NOTIONAL STUDY TIME: 300 hours

Summary

This half course introduces students to the basic statistical concepts which they may need to understand and use in the other courses they intend to study in their degree or diploma.

Aims and objectives

The emphasis of the course is on the application of statistical methods in management, economics and the social sciences. Attention will focus on the interpretation of tables and results and the appropriate way to approach statistical problems. Treatment is at an elementary mathematical level. Ideas of probability, inference and multivariate analysis are introduced and are further developed in the half course 04b Statistics 2.

Learning outcomes

At the end of the course and having completed the essential reading and activities students should

- be familiar with the key ideas of statistics that are accessible to a student with a moderate mathematical competence
- be able to routinely apply a variety of methods for explaining, summarising and presenting data and interpreting results clearly using appropriate diagrams, titles and labels when required
- be able to summarise the ideas of randomness and variability, and the way in which these link to probability theory to allow the systematic and logical collection of statistical techniques of great practical importance in many applied areas
- have a grounding in probability theory and some grasp of the most common statistical methods
- be able to perform inference to test the significance of common measures such as means and proportions and conduct chi-square tests of contingency tables
- be able to use simple linear regression and correlation analysis and know when it is appropriate to do so.

Essential reading

For full details, please refer to the reading list

Newbold,P., W. Carlson and B. Thorne *Statistics for Business and Economics.* (Pearson Education, 2019) ninth edition [ISBN 978-1292315034]

Please consult the current EMFSS Programme Regulations for further information on the availability of a course, where it can be placed on your programme's structure, and other important details.

Lindley, D.V. and W.F. Scott. *New Cambridge Statistical Tables*. (Cambridge: Cambridge University Press, 1995) second edition [ISBN 978-0521484855]

Assessment

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

Syllabus

This course introduces some of the basic ideas of theoretical statistics, emphasising the applications of these methods and the interpretation of tables and results.

Basic background: Elementary summation signs, elementary probability, Venn and tree diagrams.

Data collection: Elements of survey design, the stages of a survey, ideas of randomness, observation and experiment.

Data presentation and analysis: Descriptive statistics, measures of location and dispersion, pictorial and graphical representation.

The Normal Distribution: Estimation of mean, proportion, standard deviation, confidence intervals and hypothesis testing. Ideas of testing for differences between means and proportions. The use of Student's t.

Goodness of fit: The chi-square distribution and contingency tables.

Regression and correlation: An introduction to the ideas of regression and correlation, least squares, estimation of a, b, and r, scatter diagrams.

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