

ST903-15 Statistical Methods

22/23

Department

Statistics

Level

Taught Postgraduate Level

Module leader

Barbel Finkenstadt Rand

Credit value

15

Module duration

10 weeks

Assessment

Multiple

Study location

University of Warwick main campus, Coventry

Description

Introductory description

This module runs in term 1 and is core for students on an MSc in Statistics course. It is not available for undergraduate students.

[Module web page](#)

Module aims

The module content will include a thorough grounding in classical and Bayesian methods of statistical inference with an introduction to selected more recent developments in statistical methodology. Since MSc students have different background knowledge in statistics we start afresh. At the end of the course you will have a solid background in basic statistics and knowledge at an advanced level in some areas.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

The module content includes thorough grounding in classical methods of statistical inference with

an introduction to more recent developments in statistical methodology. The following items are going to be covered: data, probability, random variables, special univariate distributions, joint and conditional distributions, distributions of functions of random variables, methods of inference, inference using simulation, maximum likelihood estimation, Bayesian inference, general linear model.

Learning outcomes

By the end of the module, students should be able to:

- Understand basic probability and random variables.
- Make sense of univariate distributions, joint and conditional distributions and functions of random variables.
- Understand the principles of inference in particular Bayesian inference and Maximum Likelihood Estimation.
- Apply linear models in general situations.
- Understand principles of and be able to apply statistical testing using the Likelihood Ratio approach.
- Gain familiarity with basic topics in computational statistics such as importance sampling, rejection sampling etc

Indicative reading list

Casella, G. and Berger, R. L., Statistical Inference, 2nd Ed, Duxbury.

Wasserman L., All of Statistics: A Concise Course in Statistical Inference, Springer

An Introduction to Probability and Statistical Inference (second edition), by G.G. Roussas

Lecture notes will cover everything that is done in the course.

[View reading list on Talis Aspire](#)

Subject specific skills

TBC

Transferable skills

TBC

Study

Study time

Type	Required
Lectures	30 sessions of 1 hour (20%)
Private study	104 hours (69%)
Assessment	16 hours (11%)
Total	150 hours

Private study description

Weekly revision of lecture notes and materials, wider reading, practice exercises and preparing for examination.

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

Assessment group D4

	Weighting	Study time	Eligible for self-certification
Assignment 2 Due in Term 1 Week 10. The assignment will contain a number of questions for which solutions and / or written responses will be required. 500 words is equivalent to one page of text, diagrams, formula or equations; your Assignment 2 should not exceed 2 pages in length.	10%	7 hours	Yes (extension)
Assignment 1 Due in Term 1 Week 7. The assignment will contain a number of questions for which solutions and / or written responses will be required. 500 words is equivalent to one page of text, diagrams, formula or equations; your Assignment 1 should not exceed 2 pages in length.	10%	7 hours	Yes (extension)
In-person Examination The examination paper will contain four questions, of which the best marks of THREE questions will be used to calculate your grade.	80%	2 hours	No

Weighting**Study time****Eligible for self-certification**

- Answerbook Pink (12 page)
- Students may use a calculator
- Cambridge Statistical Tables (blue)

Assessment group R2**Weighting****Study time****Eligible for self-certification**

In-person Examination - Resit 100%

No

The examination paper will contain four questions, of which the best marks of THREE questions will be used to calculate your grade.

-
- Answerbook Pink (12 page)
 - Students may use a calculator
 - Cambridge Statistical Tables (blue)

Feedback on assessment

Marked assignments will be available for viewing at the support office within 20 working days of the submission deadline.

Solutions and cohort level feedback will be provided for the examination.

[Past exam papers for ST903](#)

Availability**Courses**

This module is Core for:

- Year 1 of TSTA-G4P1 Postgraduate Taught Statistics