

# ST911-15 Fundamentals of Modern Statistical Inference

**22/23**

**Department**

Statistics

**Level**

Taught Postgraduate Level

**Module leader**

Yi Yu

**Credit value**

15

**Module duration**

10 weeks

**Assessment**

50% coursework, 50% exam

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

This module runs in Term 1 and is usually taken by PhD students in the Warwick Centre for Doctoral Training in Mathematics and Statistics.

Other PhD students should consult the module leader if they are interested in taking this module.

This module is not available to undergraduate or postgraduate taught students.

[Module web page](#)

### Module aims

The aims of this module are to provide a basic introduction to ideas of formal statistical inference for students with a strong mathematical background and undergraduate performance. The course will provide all students with a basic background level of knowledge of inference and, others with a platform to use and research in Statistics within their PhD. The course will reflect the modern trends in Statistical Inference towards powerful computationally intensive methods.

### 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.

Statistical distribution theory  
Methods of inference  
Maximum likelihood estimation  
Elements of Bayesian Inference  
Decision Theory Inference  
Basic simulation methodologies  
Markov Chain Monte-Carlo methods

## Learning outcomes

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

- Understand key ideas of parameter estimation.
- Understand how to apply Statistical tools in various applied problems.
- Develop suitable strategies for the extraction of parameters from data sets.

## Indicative reading list

1. R. Keener, "Theoretical Statistics"
2. M.J. Schervish, "Theory of Statistics"
3. J. Shao, "Mathematical Statistics"
4. L. Wasserman, "All of Statistics"

[View reading list on Talis Aspire](#)

## Subject specific skills

TBC

## Transferable skills

TBC

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## Study

### Study time

Type	Required
Lectures	30 sessions of 1 hour (20%)
Private study	120 hours (80%)
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.

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## Assessment

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

### Assessment group C2

	Weighting	Study time	Eligible for self-certification
<b>Assessment component</b>			
Assessed exercises	50%		Yes (extension)
2 x assessed exercises due at evenly spaced intervals during term 1. Each problem set will contain a number of individual questions based on the material delivered in the lectures.			

Reassessment component is the same

**Assessment component**

Oral examination	50%		No
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The oral examination will take place in the week following the end of term 1.

Reassessment component is the same

## Feedback on assessment

Written feedback will be provided for the problem sets and oral examination within 20 working days.

[Past exam papers for ST911](#)

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# Availability

## Courses

This module is Core for:

- Year 1 of RSTA-G4P0 Postgraduate Research Statistics

This module is Core optional for:

- Year 1 of TMAA-G3G2 Postgraduate Taught Mathematics and Statistics

This module is Optional for:

- Year 1 of TMAA-G1PD Postgraduate Taught Interdisciplinary Mathematics (Diploma plus MSc)
- Year 1 of TMAA-G1P0 Postgraduate Taught Mathematics
- Year 1 of TMAA-G1PC Postgraduate Taught Mathematics (Diploma plus MSc)

This module is Option list A for:

- Year 1 of RMAA-G1PG Postgraduate Research Mathematics of Systems

This module is Option list B for:

- Year 1 of TMAA-G1P0 Postgraduate Taught Mathematics

This module is Option list C for:

- TMAA-G1PD Postgraduate Taught Interdisciplinary Mathematics (Diploma plus MSc)
  - Year 1 of G1PD Interdisciplinary Mathematics (Diploma plus MSc)
  - Year 2 of G1PD Interdisciplinary Mathematics (Diploma plus MSc)
- TMAA-G1PC Postgraduate Taught Mathematics (Diploma plus MSc)
  - Year 1 of G1PC Mathematics (Diploma plus MSc)
  - Year 2 of G1PC Mathematics (Diploma plus MSc)