

ST104-12 Statistical Laboratory I

20/21

Department

Statistics

Level

Undergraduate Level 1

Module leader

Samuel Touchard

Credit value

12

Module duration

10 weeks

Assessment

Multiple

Study location

University of Warwick main campus, Coventry

Description

Introductory description

This module runs in the second half of term 2 and first half of term 3.

This module is core for students with their home department in Statistics and is also available for external students who have taken the necessary prerequisites. This module will be useful for ST221 Statistical Modelling and other modules which use statistical data analysis such as Programming for Data Science and Multivariate Statistics.

Pre-requisites:

Statistics Students: ST115 Introduction to Probability

Non-Statistics Students: ST111 Probability A and ST112 Probability B

Results from the coursework from this module may be partly used to determine of exemption eligibility in the computer based assessment components of the Institute and Faculty of Actuaries modules CS1, CS2, CM1 and CM2. (Independent application to the IFoA may be required.)

[Module web page](#)

Module aims

To introduce students to the R software package, making use of it for exploratory data analysis and simple simulations. This should deepen and reinforce the understanding of probabilistic

notions being learnt in ST115 and ST111/2.

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.

Introduction to R

Exploratory data analysis: methods of visualisation and summary statistics

Sampling from standard discrete and continuous distributions (Bernoulli, Geometric, Poisson, Gaussian, Gamma)

Generic methods for sampling from univariate distributions

The use of R to illustrate probabilistic notions such as conditioning, convolutions and the law of large numbers

Examples of modelling real data (but without formal statistical inference) and the use of visualisations to assess fit

Learning outcomes

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

- Gain familiarity with the R software package, making use of it for exploratory data analysis.
- Use R to simulate samples from a variety of probability distributions.
- Gain the ability to propose appropriate probabilistic models for simple data sets.

Indicative reading list

[View reading list on Talis Aspire](#)

Subject specific skills

TBC

Transferable skills

TBC

Study

Study time

Type	Required	Optional
Lectures	29 sessions of 1 hour (24%)	2 sessions of 1 hour
Practical classes	8 sessions of 1 hour (7%)	
Total	120 hours	

Type	Required	Optional
Private study	45 hours (38%)	
Assessment	38 hours (32%)	
Total	120 hours	

Private study description

Weekly revision of lecture slides and materials, wider reading and practice exercises, developing familiarity with R programming language 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 D2

	Weighting	Study time
Laboratory Report 1	15%	18 hours
Due in Term 2 Week 10.		
The first report will emphasise on R coding skills and/or other statistical questions.		
The number of words noted below refers to the amount of time in hours that a well-prepared student who has attended lectures and carried out an appropriate amount of independent study on the material could expect to spend on this assignment. 500 words is equivalent to one page of text, diagrams, formula or equations; your ST104 Laboratory Report 1 should not exceed 18 pages in length.		
Laboratory Report 2	15%	18 hours
Due in Term 3 Week 3.		
The second report will emphasise on R as a simulation and visualisation tool and/or other statistical questions.		
The number of words noted below refers to the amount of time in hours that a well-prepared student who has attended lectures and carried out an appropriate amount of independent study on the material could expect to spend on this assignment. 500 words is equivalent to one page of text, diagrams, formula or equations; your ST104 Laboratory Report 2 should not exceed 18 pages in length.		
2 hour examination (Summer)	70%	2 hours
The examination paper will contain four questions, of which the best marks of THREE questions		

Weighting

Study time

will be used to calculate your grade.

~Platforms - Moodle

Assessment group R

Weighting

Study time

2 hour examination (September)

100%

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

~Platforms - Moodle

Feedback on assessment

Reports will be marked and returned to students within 20 working days.

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

[Past exam papers for ST104](#)

Availability

Courses

This module is Core for:

- Year 1 of USTA-G302 Undergraduate Data Science
- Year 1 of USTA-G304 Undergraduate Data Science (MSci)
- Year 1 of USTA-G300 Undergraduate Master of Mathematics, Operational Research, Statistics and Economics
- Year 1 of USTA-G1G3 Undergraduate Mathematics and Statistics (BSc MMathStat)
- Year 1 of USTA-GG14 Undergraduate Mathematics and Statistics (BSc)
- Year 1 of USTA-Y602 Undergraduate Mathematics, Operational Research, Statistics and Economics

This module is Option list B for:

- Year 1 of UMAA-G100 Undergraduate Mathematics (BSc)
- Year 1 of UMAA-G103 Undergraduate Mathematics (MMath)
- Year 1 of UMAA-G106 Undergraduate Mathematics (MMath) with Study in Europe
- Year 1 of UMAA-G1NC Undergraduate Mathematics and Business Studies
- Year 1 of UMAA-G1N2 Undergraduate Mathematics and Business Studies (with Intercalated Year)

- Year 1 of UMAA-GL11 Undergraduate Mathematics and Economics
- Year 1 of UECA-GL12 Undergraduate Mathematics and Economics (with Intercalated Year)
- Year 1 of UMAA-GV17 Undergraduate Mathematics and Philosophy
- Year 1 of UMAA-GV18 Undergraduate Mathematics and Philosophy with Intercalated Year
- Year 1 of UMAA-G101 Undergraduate Mathematics with Intercalated Year