

ST111-6 Probability (Part A)

20/21

Academic year

20/21

Department

Statistics

Level

Undergraduate Level 1

Module leader

Martyn Parker

Credit value

6

Module duration

5 weeks

Assessment

Multiple

Study location

University of Warwick main campus, Coventry

Description

Introductory description

This module runs in Term 2 and is a core or listed optional module for some degree courses (primarily in Mathematics and Computer Science) and is also available as an unusual option to students on non-listed degrees. You may be interested in this module if you have taken the prerequisites and wish to take ST112 Probability B so that you can take further statistics modules.

Pre-requisites: MA131 Analysis I AND MA132 Foundations (or equivalent)

Post-requisites: ST112 Probability B, ST104 Statistical laboratory, ST202 Stochastic Processes, ST220 Introduction to Mathematical Statistics

This module is not available to students who have their home department in Statistics, who take an equivalent module. Students who are considering transferring to a course in Data Science, Mathematics & Statistics or MORSE at the end of their first year should take this module.

[Module web page](#)

Module aims

To lay the foundation for all subsequent modules in probability and statistics, by introducing the key notions of mathematical probability and developing the techniques for calculating with

probabilities and expectations.

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.

1. Experiments with random outcomes: the notions of events and their probability. Operations with sets and their interpretations. The addition law and axiomatic definition of a probability space.
2. Simple examples of discrete probability spaces. Methods of counting: inclusion-exclusion formula and multinomial co-efficients. Examples including the birthday problem and coupon collecting.
3. Simple examples of continuous probability spaces. Points chosen uniformly at random in space.
4. Independence of events. Conditional probabilities. Simpson's paradox. Bayes theorem.
5. Binomial probabilities. The law of large numbers, Poisson and Gaussian approximations and their applications.

Learning outcomes

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

- Understand and apply in simple situations the law of large numbers, Poisson and Gaussian approximations for the Binomial distribution.
- Model simple experiments with random outcomes using mathematical probability.
- Compute probabilities by counting sample points or calculating areas/volume.
- Understand the concepts of conditional probability and independence.

Indicative reading list

[View reading list on Talis Aspire](#)

Subject specific skills

TBC

Transferable skills

TBC

Study

Study time

Type	Required	Optional
Lectures	15 sessions of 1 hour (25%)	2 sessions of 1 hour
Tutorials	2 sessions of 1 hour (3%)	
Private study	37 hours (62%)	
Assessment	6 hours (10%)	
Total	60 hours	

Private study description

Weekly revision of lecture notes and materials, wider reading and practice exercises, working on problem sets 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 D3

	Weighting	Study time
Computer Based Assessment 1	5%	3 hours
Multiple choice quiz which will take place during the term that the module is delivered.		
Computer Based Assessment 2	5%	3 hours
Multiple choice quiz which will take place during the term that the module is delivered.		
1-hour examination (Summer)	90%	
The examination paper will contain three questions, of which the best marks of TWO questions will be used to calculate your grade.		

~Platforms - Moodle

Assessment group R

	Weighting	Study time
Examination (September)	100%	
The examination paper will contain three questions, of which the best marks of TWO questions		

Weighting

Study time

will be used to calculate your grade.

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Feedback on assessment

Answers to problems sets will be marked and returned to students. Tutorials provide opportunities for students to discuss the problem sets.

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

[Past exam papers for ST111](#)

Availability

Post-requisite modules

If you pass this module, you can take:

- ST112-6 Probability (Part B)

Anti-requisite modules

If you take this module, you cannot also take:

- ST115-12 Introduction to Probability

Courses

This module is Core for:

- Year 1 of UCSA-G4G1 Undergraduate Discrete Mathematics
- Year 1 of UCSA-G4G3 Undergraduate Discrete Mathematics
- 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

This module is Optional for:

- Year 1 of UPXA-FG33 Undergraduate Mathematics and Physics (BSc MMathPhys)
- Year 1 of UPXA-GF13 Undergraduate Mathematics and Physics (BSc)
- Year 1 of UPXA-FG31 Undergraduate Mathematics and Physics (MMathPhys)