FP014-30 Mathematics for Finance

24/25

Department
  Warwick Foundation Studies
Level
  Foundation
Module leader
  Chris Jones
Credit value
  30
Module duration
  25 weeks
Assessment
  50% coursework, 50% exam
Study location
  University of Warwick main campus, Coventry

Description

Introductory description

FP014 Mathematics for Finance

[Module web page](#)

Module aims

This module provides students with the mathematical and statistical training necessary for successful degree-level study of Finance-related courses. Students will become more competent and grow in self-confidence by practising these techniques under supervision, and will develop intuition and gain valuable insight by applying these techniques to 'real-world' problems.

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.

Pure Mathematics

- Equations and Inequalities
  (solving and applying linear, quadratic, and simultaneous equations/inequalities)

- Straight Line Graphs
  (relationship between an equation and its graph; gradients, parallel and perpendicular lines)
- Exponentials and Logarithms
  (laws of indices, surds and logarithms; solving exponential equations; e and ln)
- Functions and Sketches
  (domain and range; composite and inverse functions; graph sketching techniques)
- Vectors and Matrices
  (vector properties and arithmetic; dot product and perpendicular vectors; matrix operations; 2x2 determinants and inverse matrices; solving systems of equations)
- Differentiation
  (finding derivatives of polynomial, radical, reciprocal, exponential and logarithmic functions; gradients of curves and stationary points; the chain, product and quotient rules)
- Integration
  (indefinite integration as a reverse of differentiation; evaluation of definite integrals)
- Numerical Methods
  (determining whether a solution exists in a given range; use methods such as interval bisection and Newton-Raphson to approximate solutions)
- Sequences and Series
  (making calculations involving arithmetic and geometric series, including sums to infinity)
- Expansions
  (using binomial, Maclaurin and Taylor series formulae to approximate functions)

Statistics and Probability

- Calculating Summary Statistics
  (calculating/estimating measures of location (averages and quartiles) and deviation (spread) from data provided in a list or frequency table).
- Representing Data
  (interpreting box plots and histograms; how to represent data appropriately, including when to use a particular type of graph or chart).
- Correlation and Regression
  (calculating and using the product moment correlation coefficient and least squares regression line for a set of bivariate data)
- Introduction to Statistical Software
  (handling large data sets in an electronic format; using relevant functions to calculate summary statistics and produce graphical representations)
- Probability
  (simple theoretical and experimental probability including sample spaces; Venn diagrams; tree diagrams with independent or conditional events; and expected outcomes)
- Binomial and Poisson Distribution
  (identifying Binomial and Poisson situations, and using the formulae to calculate probabilities)
- The Normal Distribution
  (using given tables to find standard Z probabilities; converting to general normal distributions)
- Confidence Intervals
  (calculating confidence intervals for means and proportions, using various confidence levels)

- Hypothesis Testing
  (testing one-tailed and two-tailed hypotheses for population means and proportions; conducting a chi-squared test on some categorical data)

Learning outcomes

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

- Solve a variety of mathematical problems by selecting appropriate logical methods and implementing them precisely and rigorously to arrive at correct numerical or algebraic results.
- Undertake basic analyses of data by calculating summary statistics and representing data graphically, taking into account the suitability and limitations of different statistical measures and graph types.
- Use fundamental principles of probability to quantify uncertainty, and solve problems involving a selection of discrete and continuous probability distributions.
- Present written mathematical and statistical work clearly and logically.
- Apply mathematical and statistical knowledge to a variety of real-world contexts, selecting appropriate algebraic tools and statistical models where necessary.
- Interpret the meaning of calculated results within a given context, and use them to inform decision-making.
- Utilise technology such as a calculator or spreadsheet software to perform numerical calculation accurately.

Indicative reading list

Quantitative Methods for Business, Management and Finance (Swift and Piff, 2014)

Elements of Mathematics for Economics and Finance (Mavron and Phillips, 2010)

Probability and Statistics for Finance (Fabozzi et al, 2011)

Statistics for Economics, Accounting and Business Studies (Barrow, 2017)

[View reading list on Talis Aspire](#)

Subject specific skills

No subject specific skills defined for this module.

Transferable skills

No transferable skills defined for this module.

Study

Study time

Type	Required
Lectures	25 sessions of 1 hour (8%)
Seminars	75 sessions of 1 hour (25%)
Private study	140 hours (47%)
Assessment	60 hours (20%)
Total	300 hours

Private study description

Independent study

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group C1

	Weighting	Study time
Class Test	25%	15 hours

Students complete short-answer questions covering the majority of the topics in the Pure Mathematics section of the module. In-person, closed book.

	Weighting	Study time
Statistical Report	25%	15 hours

Students are given a large data set and must carry out simple analyses using statistical analysis software, presenting their findings in a short report according to a fictional scenario.

	Weighting	Study time
In-Person Examination	50%	30 hours

Students complete questions across all topics of the module, including some which may require them to link multiple topics together and some which may be longer worded problems with real-world contexts. Closed book.

- Answerbook Pink (12 page)
- Students may use a calculator

Feedback on assessment

Students to view their marked script for the class test as well as model solutions, and written feedback will be provided electronically for the Statistical Report.

[Past exam papers for FP014](#)

Availability

Courses

This module is Core for:

- FIOE Warwick International Foundation Programme
  - Year 1 of FP09 Warwick International Foundation Programme - Business Studies and Economics
  - Year 1 of FP15 Warwick International Foundation Programme - Finance