Quantitative Methods for Finance and Investment
### ifs School of Finance
#### MODULE SPECIFICATION

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<tr>
<td>1. <strong>Title</strong></td>
<td>Quantitative Methods for Finance and Investment</td>
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<tr>
<td>2. <strong>Start date</strong></td>
<td>Valid for study sessions commencing from 1 November 2011</td>
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<td>3. <strong>Level of module</strong></td>
<td>5 (within QAA Framework for Higher Education) Subject benchmark: General Business &amp; Management</td>
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<td>4. <strong>Number of credits</strong></td>
<td>30 credits</td>
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<td>5. <strong>Status</strong></td>
<td>Option module</td>
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| 6. **Recommended prior modules** | • Organisational Management in Financial Services  
• Financial Services: The Commercial Environment |
| 7. **Programmes of study to which module contributes** | Foundation Degree in Banking Practice and Management/Professional Diploma in Banking Practice and Management |
8. **Purpose/rationale/positioning**

Quantitative Methods for Finance and Investment is an option module within the Foundation Degree programme and is designed for students whose work will involve an understanding of quantitative methods.

This module provides students with an understanding of the quantitative methods for finance and investment. This includes the ability to formulate problems into quantitative models, to aid the successful resolution of the problem. Students will learn how to apply statistical methods to analyse past data and infer future trends. Using output from mathematical and statistical models, students will learn to analyse, interpret and derive potential outcomes from quantitative information.

Upon completion of this module students will be able to demonstrate an understanding of applying quantitative techniques to a range of problems in the finance and investment environment. Students will have the ability to select appropriate mathematical and statistical techniques and apply them to problems in the finance and investment context. Students will also be able to communicate the results of quantitative analyses in the contexts of finance and investment, to both specialists and non-specialists, recognising any limitations of the underlying models.

It covers:

- formulating problems into quantitative models;
- applying statistical methods of analysis;
- recognising limitations of the quantitative models; and
- communicating the results of quantitative analysis.
9. Intended subject-specific learning outcomes and, as appropriate, their relationship to programme learning outcomes

On completion of this module, students will be able to:

1. formulate problems into quantitative models;
2. demonstrate competency in numeric skills;
3. apply statistical methods to analyse past data and infer future trends;
4. derive outcomes, analyse and interpret output from mathematical and statistical models;
5. select appropriate mathematical and statistical techniques for application to problems in the contexts of finance and investment;
6. implement the analysis and evaluation of numerical solutions to business problems;
7. demonstrate an understanding of appropriate application of quantitative techniques to a range of problems in the finance and investment contexts;
8. communicate the results of quantitative analyses in the contexts of finance and investment, to both specialists and non-specialists, recognising any limitations of the underlying models;
9. conduct mathematical and statistical investigations within the contexts of finance and investment.

These module intended learning outcomes contribute to the following programme learning outcomes: A1, A3, A4, A5, A7, A8, A9, A10, A11, A12, A13, together with the generic programme skills set out in section B-D of the programme specification.

10. Intended generic learning outcomes and, as appropriate, their relationship to programme learning outcomes

On completion of this module students will be able to demonstrate achievement of the following generic learning outcomes:

1. Ability to analyse problems, identify appropriate solutions and advise on decisions.
2. Ability to communicate effectively in a manner appropriate to the context and audience.
3. Ability to find, select and organise data, abstract meaning from information and disseminate to others.
4. Ability to work with complex material.
5. Development of Critical thinking skills.
6. Development of numeric and quantitative skills.
7. Ability to learn through reflection on practice and experience.
8. Ability to work independently as well as apply skills of organisation and time management.

These intended generic learning outcomes contribute to the generic programme skills set out in section B-D of the programme specification.
11. Methods of delivery

Students are required to follow an approved course of study that provides them with learning support. There are three distinct modes of study:

1. At approved Academic Centres authorised by ifs to provide tuition for the programme.
2. On a distance learning basis with tutorial support being provided by ifs’ network of academic associates.
3. On a flexible learning basis which is distance learning plus 3 enhancement workshops delivered by your academic associate.

Students will be provided with access to my ifslearning (our secure learning environment) that provides access to relevant materials and support for each module. Links to appropriate readings are available from ifs KnowledgeBank, our e-library.

Students may opt to pursue the module by either of the above modes of study, and will undertake their learning for each module within designated study sessions that will culminate in a final assessment.

Study hours:

The module is the equivalent of 300 notional learning hours. This learning may be acquired in a variety of ways:

- Via the support offered by Academic Centres, ifs distance learning provision or flexible learning provision.
- By private study.
- By completing formative assignments.
- By learning acquired and applied in the work environment.
- By reflecting on and utilising previous learning.
12. Assessment

Achievement of the learning outcomes for each option module is assessed in two ways:

- Via a written examination; and
- Via a summative coursework assignment. This assessment uses the underpinning subject knowledge assessed in the examination as the framework within which to assess the achievement of the intellectual, subject-specific and transferable skills summarised in the module specification. It is recommended for each module that the summative assignment should not be submitted for marking until the associated formative assignments have been submitted and tutor feedback has been received.

Examination:

This component will contribute 70% of the overall assessment. Examination questions will be practical, application-based and be focused at an operational level. According to the nature of the subject matter, a variety of question styles and approaches will be included in the examination. Questions might be based on case study materials and require a discursive answer, a business report or a series of shorter answers. Students will typically be required to explore and compare the technical aspects of an issue or topic or to apply their understanding to, for example, solve a problem or provide a recommended solution for a customer. The examination is designed to assess the subject specific intended learning outcomes 1 to 9 and the generic intended learning outcomes 1 to 7. Feedback will be provided on this component.

The question paper will be structured as follows:

- Two compulsory 20-mark questions; and
- One 10-mark question from a choice of two.

The pass mark for this component is 40%.

Time allowed: Two hours [plus 15 minutes preparation time].

You may use a scientific calculator but it must not be programmable, nor have a wireless-communications capability, nor be capable of storing textual information. It must also not require a mains electricity supply. Calculators with any further functions are not allowed in the examination room.

Summative coursework assignment:

This component will contribute 30% of the overall assessment and will be based upon the submission of one assignment at the end of the course but prior to the examination. Both the subject specific and generic intended learning outcomes will be assessed the assignment will take the form of case study questions based on stimulus material. Students will be expected to conduct a quantitative investigation. This will involve the identification and selection of data, a quantitative formulation of a business problem, the application of mathematical and statistical techniques, the analysis and evaluation of outputs and the communication of findings and recommendations. Feedback will be provided on this component.
At regular intervals during the course of study, students will be expected to submit three short formative assignments. These assignments will take the form of developmental learning activities towards the assessed coursework and unseen examination components and will be integrated within the study plan. They will provide students both with opportunities to reinforce their learning as they progress through the course of study and the opportunity to prepare for both the summative assignment and unseen examination.

Whilst these formative assignments will not contribute to the overall assessment, students are strongly advised to take the opportunity to complete them, as feedback will be provided from their tutor on their progress through the course of study.

The pass mark for this component is 40%.

13. Syllabus overview

This module has been designed to further develop the quantitative skills of participants as well as to develop new skills in the application of mathematical and statistical techniques to the contexts of finance and investment. The module content not only focuses on the application of quantitative techniques and analysis but it develops understanding of appropriate application to specific contexts, the implications of limitations within models and the importance of communicating any reservations.

14. Syllabus

1. Useful mathematical functions:
   - Graphing and solving linear functions.
   - Simultaneous equations.
   - Simple polynomials.
   - Discrete and continuous compounding.
   - Discounting – link to interest.
   - Logarithmic and exponential functions.
   - Interpretation within a business context.

2. Data collection and useful information:
   - Descriptive statistics: data presentation.
   - Frequency distributions.
   - Measures of central tendency.
   - Dispersion.
   - Summaries of data and usefulness of trends, patterns and exceptions.

3. Probability:
   - The concept of probability.
   - Discrete and continuous random variables.
   - Distributions.
   - Expected values.
   - Links to business data.
4. **Introduction to sampling:**
- Population – samples.
- Inference.
- Random sampling – its usefulness.
- Hypothesis testing – the approach.
- Confidence intervals – interpretation.
- Comparing two populations – large and small samples, paired samples
- Usefulness with a business context.

5. **Introduction to regression:**
- The usefulness of regression analysis.
- The concept of correlation.
- Scatter diagrams.
- Simple least squares regression and correlation.
- Interpretation of outcomes.
- Introduction to multiple regression.
- Strength of evidence – statistical testing.
- Standard error.
- Link to decision-making in a business context.

6. **Differentiation and integration:**
- The concepts of differentiation and integration.
- The relationship between of differentiation and integration.
- Graphical analysis and interpretation.
- Optimisation.
- Partial differentiation.
7. Decision trees

- Analysing linked, successive decisions and representing these in tree form with decision and change nodes.
- Calculating expected monetary values at each node of the tree.
- Deriving the optimal decisions to be taken at each stage.