

## Module 4: Quantitative Analysis for Business

<b>Stage</b>								1
<b>Semester</b>								1
<b>Module Title</b>								Quantitative Analysis for Business
<b>Module Number</b>								4
<b>Module Status</b>								Mandatory
<b>Module ECTS Credits</b>								10
<b>Module NFQ level</b>								6
<b>Pre-Requisite Module Titles</b>								N/A
<b>Co-Requisite Module Titles</b>								N/A
<b>Capstone Module?</b>								No
<b>List of Module Teaching Personnel</b>								James O’Leary, Donal Hickey
<b>Contact Hours</b>					<b>Non-contact Hours</b>		<b>Total Effort (hours)</b>	
46					154		200	
<b>Lecture</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Seminar</b>	<b>Assignment</b>	<b>Placement</b>	<b>Independent Work</b>		
36		10		25		129	200	
<b>Allocation of Marks (Within the Module)</b>								
	<b>Continuous Assessment</b>	<b>Project</b>	<b>Practical</b>	<b>Final Examination</b>	<b>Total</b>			
<b>Percentage Contribution</b>	30%			70%	100%			

### Intended Module Learning Outcomes

On successful completion of this module, the learner will be able to:

1. Discuss alternative strategies used to gather sample data
2. Analyse data using measures of location and dispersion
3. Draw inferences from sample data regarding the relevant population
4. Apply mathematical techniques to problem solving
5. Calculate and interpret the nature of correlation between variables
6. Apply appropriate mathematical tools to financial data including discounting and investment appraisal
7. Explain probability and be able to use a range of techniques to calculate probabilities

### Module Objectives

The main objective is to ensure that learners appreciate the importance of mathematics and statistics for successful decision making in a range of business disciplines (e.g. finance, economics, marketing etc.). They learn how to apply these mathematical skills to manipulate and interpret numerical data. They are required to use a statistical package to support them in their application of mathematics and statistics in their analysis of business data.

## **Module Curriculum**

### **Collection and presentation of data**

- Data types and sampling methods
- Tables, diagrams and graphs
- Frequency distributions

### **Analysis of Data**

- Measures of central tendency
- Measures of dispersion
- The Normal distribution
- Confidence intervals for population mean and proportion
- Sample error and sample size
- Hypothesis testing: Z-tests, and  $\chi^2$ - tests

### **Modelling Business/Economic Problems**

- Linear equations
- Solving simultaneous equations
- Quadratic and cubic equations
- Differential calculus
- Supply and demand curves
- Cost, revenue and profit functions
- Elasticity of demand

### **Correlation and Regression**

- Scatter graphs
- The correlation coefficient
- The coefficient of determination
- The least squares regression equation
- Interpolation and extrapolation
- Spearman's rank correlation coefficient

### **Financial Mathematics**

- Simple and compound interest
- Nominal and effective interest rates
- Depreciation
- Sinking funds
- Discounting cash flows including annuities and perpetuities
- Investment appraisal using net present value and internal rate of return

### **Probability**

- The laws of probability
- Calculating probabilities using Binomial, Poisson and Normal distributions
- Bayes Theorem

## **Reading lists and other learning materials**

Curwin, J. and Slater, R. (2008) *Quantitative Methods for Business Decisions* 6<sup>th</sup> edition. Thomson: London

Reilly, J. *Using Statistics*, (2006) Gill and Macmillan  
Class notes and tutorial problems

## **Module Learning Environment**

Teaching is based on a combination of lectures and tutorials. Lectures are delivered to the full cohort of learners. The series of lectures cover/explain all of the material included in the module curriculum in a structured way. Learners are provided with a set of bound lecture notes covering all the relevant material, also included in the notes are worked examples and problems designed to test the learner's understanding. The objective is to create an environment where learners develop a shared sense of engagement and learning.

Tutorials are delivered to smaller groups of learners. The purpose of tutorials is to clarify any issues that may arise from the lectures. A set of tutorial problems form the basis for the series of tutorials. These are designed to develop the learner's competence regarding learning outcomes and also clarify assessment and grading criteria. The objective is to create an environment which is informal, interactive and purposeful. Tutorials are used to introduce learners to Excel and demonstrate its capacity regarding mathematical and statistical analysis of data.

## **Module Teaching and Learning Strategy**

Teaching is based on a series of lectures and tutorials. The series of lectures is structured to cover the topics in the module curriculum in sequential order. Learners are given material in advance of lectures and therefore come to lectures with their own desired level of preparedness. Using a constructivist approach the class builds on this and allows learners to develop their understanding at their own pace. Problem solving is the focus of tutorial work. Learners are provided with a set of problems to assist them with their learning. These problems, with solutions, are also provided on Moodle. Tutorials also provide an opportunity for learners to raise any issues that concern them in a relaxed, informal environment.

Learners are made aware of the overlap between this module and many of their other modules. This allows for integration of ideas between disciplines thus creating more engagement in the classroom. The knowledge gained in Microeconomics will integrate with modelling economic problems. Their use of Excel overlaps with their IT studies and the material covered for Financial Mathematics will be of benefit to their studies in Accounting and Finance.

## **Module Assessment Strategy**

Assessment is based on a combination of continuous assessment and an end of semester exam. The totality of assessment is designed in such a way so as to cover all the module outcomes. Continuous assessment is based on an individual piece of coursework where the learner is required to use Excel. The coursework accounts for 30% of the overall weighted assessment. The end of semester exam is a two hour paper where the learner is required to

select any 4 questions from 6. The exam accounts for 70% of the overall weighted assessment.

### Constructive Alignment of Assessment

Module Learning Outcomes	Assessment Strategy	
	Assignment	Exam
Discuss alternative strategies used to gather sample data	Yes	
Analyse data using measures of location and dispersion.	Yes	
Draw inferences from sample data regarding the relevant population.	Yes	
Apply mathematical techniques to problem solving		Yes
Calculate and interpret the nature of correlation between variables		Yes
Apply appropriate mathematical tools to financial data including discounting and investment appraisal		Yes
Explain probability and be able to use a range of techniques to calculate probabilities		Yes