

**(9) Quantitative Techniques–BQTH3013**

1.	Name of Course				Quantitative Techniques	
2.	Course Code				BQTH3013	
3.	Name(s) of academic staff					
4.	Rationale for the inclusion of the course/module in the programme				Quantitative Analysis provides data-driven analytical services for a range of business challenges, specializing in statistical models for site selection decisions. In today's environment, the volume of data available for business decisions has increased dramatically. Yet too often data is not fully leveraged as a business asset because of trim analytical staffs and information overload. Quantitative Analysis can assist by applying advanced statistical analysis techniques to help get more from the data, as well as external data sources.	
5.	Semester and Year offered				1/2	
6.	Total Student Learning Time (SLT)		Face to Face			Total Guided and Independent Learning
	L = Lecture T = Tutorial P = Practical O= Others		L	T	P	O
			28	14		
						Guided = 42 Independent = 84 <b>Total = 126</b>
7.	Credit Value				3	
8.	Prerequisite (if any)				None	
9.	Objectives:  The goal of this course is to give students practical, hands-on experience conducting quantitative economic analysis of markets and policy. This will be done through a series of homework assignments which will combine analytics with computation in order to help students to bridge the gap between theory and application					

**(9) Quantitative Techniques–BQTH3013**

10.	<p>Learning outcomes:</p> <p>At the completion of the subject, students should be able to perform the following tasks:</p> <ul style="list-style-type: none"> <li>• Be an intelligent user and interpreter of analytical models and statistical information.</li> <li>• Be able to frame common managerial problems in analytical terms.</li> <li>• Understand the importance of mathematical concepts for expressing and interpreting rates of change.</li> <li>• Recognize opportunities to use spreadsheets to implement, analyze, and optimize basic analytical models.</li> <li>• Understand the nature of data and how it is obtained.</li> <li>• Understand statistical processes for transforming data into useful information.</li> <li>• Develop a working familiarity with basic computational tools of data summarization, analysis, modelling, and optimization along with a level of self sufficiency in their use.</li> <li>• Be able to effectively communicate the results of quantitative analyses and models, especially through the use of statistical graphics and other visualization tools.</li> <li>• Recognize opportunities for strategic application of analytical thinking to advance your career and your enterprise.</li> <li>• Build confidence in your ability to creatively and intelligently exploit analytical opportunities</li> </ul>
11.	<p>Transferable Skills:</p> <p>Being deductive and particularistic, quantitative research is aimed in rationally formulating the research project and verifying the contents empirically on a specific set of data. The strengths students are expected to acquire from quantitative method include:</p> <ul style="list-style-type: none"> <li>• Stating the research problem in very specific and set terms</li> <li>• Clearly and precisely specifying both the independent and the dependent variables under investigation</li> <li>• Following firmly the original set of research goals, arriving at more objective conclusions, testing hypothesis, determining the issues of causality</li> <li>• Achieving high levels of reliability of gathered data due to controlled observations, laboratory experiments, mass surveys, or other form of research manipulations</li> <li>• Eliminating or minimizing subjectivity of judgment</li> <li>• Allowing for longitudinal measures of subsequent performance of research subjects</li> </ul>

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12.	<p>Teaching-learning and assessment strategy</p> <p>A variety of teaching and learning strategies are used throughout the course, including:</p> <ul style="list-style-type: none"> <li>• Lecture sessions</li> <li>• Tutorial sessions</li> <li>• Case Studies</li> <li>• Student-Lecturer discussion</li> <li>• Collaborative and co-operative learning</li> <li>• Workshops and Training Seminars</li> <li>• Independent study</li> </ul> <p>Assessment strategies include the following:</p> <ul style="list-style-type: none"> <li>• Ongoing quizzes</li> <li>• Midterm tests</li> <li>• Performance Assessment (Participation, project, Assigned exercises)</li> <li>• Case Presentations</li> </ul>														
13.	<p>Synopsis:</p> <p>The course introduces students to the scientific approach to managerial decisions making. The approach consists of problem definition, model development, data collection, model implementation using the data, model validation, result analysis, and using the findings to implement changes which solve the original problem. Various quantitative models and methods will be discussed. The assumptions and limitations of the various models and methods will be discussed with case study assignments used to demonstrate the real world usefulness of each technique.</p>														
14.	<p>Mode of Delivery: Face to Face</p> <ul style="list-style-type: none"> <li>• Lecture sessions</li> <li>• Tutorial sessions</li> </ul>														
15.	<p>Assessment Methods and Types:</p> <p>The assessment for this course will be based on the following:</p> <table> <tr> <td>Coursework</td><td><b>50%</b></td></tr> <tr> <td>Quizzes</td><td>10%</td></tr> <tr> <td>Assignments</td><td>10%</td></tr> <tr> <td>Project</td><td>10%</td></tr> <tr> <td>Mid-Semester Exam</td><td>20%</td></tr> <tr> <td>Final Examination</td><td><b>50%.</b></td></tr> <tr> <td><b>Total</b></td><td><b>100%</b></td></tr> </table>	Coursework	<b>50%</b>	Quizzes	10%	Assignments	10%	Project	10%	Mid-Semester Exam	20%	Final Examination	<b>50%.</b>	<b>Total</b>	<b>100%</b>
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16.	Mapping of the course/module to the Programme Aims The individual course is mapped to the programme aims using a scale of <b>one</b> to <b>five</b> where (one being the least relevant/related and five being the most relevant/ related).													
	A1		A2		A3		A4		A5		A6			
	4		4		4		3		3		3			
17.	Mapping of the course/module to the Programme Learning Outcomes The learning outcomes of this course are mapped to the eight MQF domains using a scale of <b>one</b> to <b>five</b> where (one being the least relevant/related and five being the most relevant/ related).													
	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12		
	2	4	2	5	4	4	2	2	4	2	4	4		
18.	Content outline of the course/module and the SLT per topic													
	WEEK	Details								SLT				
										L	T	Indep.	Total	
	WEEK 1	<b>Grouping and Displaying Data: Tables and Graphs</b> <ul style="list-style-type: none"><li>Arrangement of data.</li><li>Constructing a Frequency Distribution.</li><li>Graphing Frequency Distributions</li></ul>								2	1	6	9	
	WEEK 2	<b>Measures of Central Tendency and Dispersion in Frequency Distribution</b> <ul style="list-style-type: none"><li>Measures of Central Tendency</li><li>Mean, Median &amp; Mode.</li><li>Measures of Dispersion : Ranges, Average Deviation</li><li>Measures Relative Dispersion</li><li>Coefficient of variation</li></ul>								2	1	6	9	
	WEEK 3	<b>Basic Probability</b> <ul style="list-style-type: none"><li>Objective and subjective probability</li><li>Basic probability concepts</li><li>Rules of probability</li></ul>								2	1	6	9	

**(9) Quantitative Techniques–BQTH3013**

WEEK 4	<b>Probability distribution</b> <ul style="list-style-type: none"> <li>Discrete distribution</li> <li>Binomial and Poisson distribution.</li> <li>Continuous distribution</li> <li>Normal distribution</li> </ul>	2	1	6	9
WEEK 5, 6	<b>Estimation</b> <ul style="list-style-type: none"> <li>Point and Confidence Interval Estimates for the mean and proportion.</li> <li>Sample size determination for the mean and proportion.</li> <li>Estimation and simple size determination for finite populations</li> </ul>	4	2	12	18
WEEK 7	<b>Hypothesis Testing 1 (One sample test)</b> <ul style="list-style-type: none"> <li>The hypothesis testing procedure.</li> <li>Type 1 and type 11 error</li> <li>Test of hypothesis for mean and proportion</li> </ul>	2	1	6	9
WEEK 8	<b>Hypothesis Testing 11 ( Two sample test)</b> <ul style="list-style-type: none"> <li>Testing for differences between the means and proportions</li> </ul>	2	1	6	9
WEEK 9	<b>Simple Linear Regression Model and Correlation</b> <ul style="list-style-type: none"> <li>Introduction. Types of regression models.</li> <li>Determining the Simple Linear Regression Equation.</li> <li>Correlation Analysis</li> </ul>	2	1	6	9
WEEK 10	<b>Multiple Regression</b> <ul style="list-style-type: none"> <li>Why multiple regression?</li> <li>Examples, Assumptions, Visual representation, Estimation</li> <li>Fundamental Equation of Regression Analysis</li> <li>ANOVA approach to Multiple regression</li> <li>Regression diagnostics</li> </ul>	2	1	6	9
WEEK 11, 12	<b>Index Numbers</b> <ul style="list-style-type: none"> <li>Defining an Index Number.</li> <li>Unweighted Aggregates Index.</li> <li>Weighted Aggregate Index.</li> <li>Average of Relatives Methods.</li> <li>Issues in Constructing and Using Index Numbers</li> </ul>	4	2	12	18

**(9) Quantitative Techniques–BQTH3013**

	WEEK 13	<b>Time Series</b> <ul style="list-style-type: none"> <li>• Systematic pattern and random noise</li> <li>• General aspects of time series patterns</li> <li>• Trend Analysis</li> <li>• Analysis of Seasonality</li> </ul>	2	1	6	9
	WEEK 14	<b>Financial Mathematics</b> <ul style="list-style-type: none"> <li>• Computational resources</li> <li>• Interest</li> <li>• Annuities.</li> </ul>	2	1	6	9
		Total	28	14	84	126
19.	<b>Main references supporting the course:</b>  Render, Stair & Hanna. (2009). <i>Quantitative Analysis for Management</i> , (10 <sup>th</sup> Edition), Pearson  <b>Additional references supporting the course:</b>  1. Waters & Waters. (2008). <i>Quantitative Methods for Business</i> , (4 <sup>th</sup> Edition), Pearson 2. Ann E. Watkins, Richard L. Scheaffer, George W. Cobb. (2010). <i>Statistics: From Data to Decision</i> , (2 <sup>nd</sup> Edition), Wiley					
20.	<b>Other additional information</b> All related subject materials will be available to the students during the period of the course					