

# BSc (Hons) Business Statistics with Marketing – SH308

## 1.Objectives

This programme is designed to produce a class of business professionals conversant with rigorous statistical and quantitative techniques and able to apply their power in the business environment. Students will be trained in the analysis of data to evaluate risks and extract business intelligence that can give businesses a competitive edge in an increasingly tight playing field. This programme will pay special attention to the marketing function of businesses.

## 2.General Entry Requirements

In accordance with the University General Entry Requirements for admission to undergraduate degree Programmes.

## 3.Programme Requirements

Credit in English at SC/GCE ‘O’ Level **and**

Passes in two “A” level subjects including Mathematics - Preference will be given to applicants having at least a “B” in Mathematics

## 4. Programme Duration

	<b>Normal</b>	<b>Maximum</b>
Degree	3 Years	5 Years

## 5. Credits per Year

Maximum 48 credits, Minimum 18 credits, subject to regulation 4.

## 6. Minimum Credits Required for Degree Award: 103

Breakdown as follows:

	<b>Credits from</b>			
	<b>Core Taught Modules</b>	<b>Project/ Dissertation</b>	<b>Electives</b>	<b>GEMS</b>
Degree	81	10	6	6

## 7. Assessment

Each module will be assessed over 100 marks with details as follows (unless otherwise specified):

The continuous assessment will count for 20 – 30% of the overall percentage mark of the module (s).

Continuous assessment may be based on seminars and/or assignments and should include at least two (2) assignments/tests per module.

## 8. Submission Deadline for Dissertation

Four copies of the dissertation (three spiral-bound copies and one copy on disk) should be submitted to the Faculty/Centre Registry not later than the last working day of March of the academic year.

## 9. List of Modules – BSc (Hons) Business Statistics with Marketing

<b>Code CORE</b>	<b>Module Name</b>	<b>Hrs/Wrk L+P</b>	<b>Credits</b>
STAT 1131(1)	Mathematics for Statistics	3+0	3
STAT 1008Y(1)	Uncertainty and Inference	3+0	6
STAT 1009Y(1)	Statistical Reasoning and Practical Data Handling	3+0	6
STAT 2003Y(3)	Statistical Computing and Data Graphics	3+0	6
STAT 2004Y(3)	Statistical Inference and Decision Making	3+0	6
STAT 2005Y(3)	Survey Methods and Sampling Techniques	3+0	6
STAT 2222(3)	Operational Research	3+0	3
STAT 3014Y(5)	Multivariate Analysis & Business Intelligence	3+0	6
STAT 3015Y(5)	Time Series Analysis and Business Forecasting	3+0	6
ECON 1215(1)	Economics	3+0	3
ECON 2190(3)	Managerial Economics I	3+0	3
MGT 1067Y(1)	Principles and Practices of Management	3+0	6
MGT 1203(1)	Marketing Fundamentals	3+0	3
MGT 2060Y(3)	Marketing Management	3+0	6
MGT 2064Y(3)	Marketing Communications	3+0	6
MGT 3065Y(3)	Strategic Marketing Management	3+0	6
STAT 3000Y(5)	Dissertation	-	10
	GEM	-	6
<b>ELECTIVES</b>			
STAT 3016Y(5)	Stochastic Processes and Stochastic Finance	3+0	6
STAT 3017Y(5)	Generalised Linear Models and Survival Analysis	3+0	6
MGT 3076Y(5)	Internet Marketing	3+0	6
MGT 3081Y(5)	Retail Marketing	3+0	6
ECON 3131(5)	International Trade	3+0	3
ECON 3182(5)	Introduction to Risk Management	3+0	3

10. Programme Plan – Bsc (Hons) Business Statistics with Marketing

**LEVEL I**

<b>Code CORE</b>	<b>Module Name</b>	<b>Hrs/Wrk L+P</b>	<b>Credits</b>
STAT 1131(1)	Mathematics for Statistics	3+0	3
STAT 1008Y(1)	Uncertainty and Inference	3+0	6
STAT 1009Y(1)	Statistical Reasoning and Practical Data Handling	3+0	6
ECON 1215(1)	Economics	3+0	3
MGT 1067Y(1)	Principles and Practices of Management	3+0	6
MGT 1203(1)	Marketing Fundamentals	3+0	3
	GEM	-	6

**LEVEL II**

<b>Code CORE</b>	<b>Module Name</b>	<b>Hrs/Wrk L+P</b>	<b>Credits</b>
STAT 2003Y(3)	Statistical Computing and Data Graphics	3+0	6
STAT 2004Y(3)	Statistical Inference and Decision Making	3+0	6
STAT 2005Y(3)	Survey Methods and Sampling Techniques	3+0	6
STAT 2222(3)	Operational Research	3+0	3
ECON 2190(3)	Managerial Economics I	3+0	3
MGT 2060Y(3)	Marketing Management	3+0	6
MGT 2064Y(3)	Marketing Communications	3+0	6

**LEVEL III**

<b>Code CORE</b>	<b>Module Name</b>	<b>Hrs/Wrk L+P</b>	<b>Credits</b>
MGT 3065Y(5)	Strategic Marketing Management	3+0	6
STAT 3014Y(5)	Multivariate Analysis and Business Intelligence	3+0	6
STAT 3015Y(5)	Time Series Analysis and Business Forecasting	3+0	6
STAT 3000Y(5)	Dissertation		10
<b>ELECTIVES</b>	<b>CHOOSE 6 CREDITS FROM</b>		
STAT 3016Y(5)	Stochastic Processes and Stochastic Finance	3+0	6
STAT 3017Y(5)	Generalised Linear Models and Survival Analysis	3+0	6
MGT 3076Y(5)	Internet Marketing	3+0	6
MGT 3081Y(5)	Retail Marketing	3+0	6
ECON 3131(5)	International Trade	3+0	3
ECON 3182(5)	Introduction to Risk Management	3+0	3

## **11. Outline Syllabus**

### **STAT 1131(1) - MATHEMATICS FOR STATISTICS**

Summation notation. Functions and their limits. Differentiation. Taylor series. Integration. Partial derivatives. Relative minima, maxima, saddle point. Double integral. Beta and Gamma integral. Applications of matrices.

### **STAT 1008Y(1) - UNCERTAINTY AND INFERENCE**

The nature of uncertainty in business. Subjective and objective methods. The probabilistic framework. Probability distributions. Expectation and variance. Common discrete and continuous distributions. Applications in business. Bayesian approach.

Introduction to Statistical Inference: Point and interval estimation. Hypothesis testing.

### **STAT 1009Y(1) - STATISTICAL REASONING AND PRACTICAL DATA HANDLING**

Statistical Thinking. Objectives of statistical analysis. Data Structures. Levels of measurement. Basic processing techniques: sorting, ranking, classification. Data summaries: rates, ratios, percentages, averages and measures of variation and skewness. The construction of indices and indicators. Graphical and Tabular analysis and presentation. Exploratory Data Analysis. The analysis of relationships. Elementary time series analysis and forecasting. The use of computers and computer software (EXCEL, MINITAB and SPSS) in implementing the above.

### **ECON 1215(1) - ECONOMICS**

Economic problem; demand and supply; Market mechanism, Theory of production, market structure and firm, factor market, microeconomic issues and regulations, public goods and social welfare, International trade and National Income, Money and financial system, Exchange rate and Balance of payments, Macroeconomic objectives and tools. Overview of Mauritian economic problems, Impact of globalisation and liberalisation.

### **MGT 1067Y(1) - PRINCIPLES AND PRACTICE OF MANAGEMENT**

The study of organisations; The environment of Organisations; Evolution of Management theory; Management concepts; Functional Areas of Management: Production, Finance, HR and Marketing, The Managerial functions of Planning, Leading, Organising, Controlling; Managerial Skills. Managing individuals in organisations: Managing differences; Motivation, Managing Groups and Teams: Group behaviour; Conflict and co-operation; Power and Politics; Leadership; Social Responsibility. Managing Structure and processes: Organisational structure; Job design; Restructuring, Communications, Careers, Change; Diversity; Knowledge Management. Evolution of Marketing, Marketing Mix, 4 Ps of marketing.

### **MGT 1203(1) - MARKETING FUNDAMENTALS**

Introduces the foundation of marketing and its key concepts: the Marketing Concept, Customer Satisfaction and Customer Value. Topics covered will include: evolution in Marketing Management philosophy; the marketing environment (Internal and External environment); the marketing research process; Consumer and Organisational buying behaviour; Market segmentation, positioning and targeting; The Marketing mix: product, price, promotion and distribution strategy of firms; Social Responsibility and green marketing.

### **STAT 2003Y(3) - STATISTICAL COMPUTING AND DATA GRAPHICS**

An introduction to R language. Numbers and Vectors. Objects, their modes and attributes. Ordered and unordered factors. Arrays and Matrices. List and Data frames. Grouping, loops and conditional execution. Writing functions. Statistical models in R. Kernel Density Estimation using R. Graphical Procedures in R. Bootstrap & Re-sampling.

Principles of good Graphics. Video Presentation of Hans Rosling. History of statistical Graphs. Traditional Statistical Graphs. An introduction to R graphics. Trellis Graphs. Bubble Plot. Graphing Categorical Data using Mondrian. Graphing of 3 Dimensional Data in R.

**STAT 2004Y(3) – STATISTICAL INFERENCE AND DECISION MAKING**

Properties of estimators. Methods for deriving confidence intervals. Hypothesis testing. Likelihood ratio tests. Inference for ANOVA. Simple random effects model. Bayesian inference: the incorporation of prior information in the inferential process.

Bayesian decision theory: the integration of prior information, data and cost information. Utilities. Decision trees. Applications.

**STAT 2005Y(3) - SURVEY METHODS AND SAMPLING TECHNIQUES**

Data collection strategies. The advantages of sampling. Sampling and non sampling errors. Stages in a sample survey. Alternative methods of administering a survey questionnaire. The design of survey questionnaires. Criteria for choosing sampling schemes. Simple random sampling. Stratified sampling. Systematic sampling. Cluster sampling. Multistage sampling. Estimates of means and proportions and their precision under alternative sample designs. Ratio and Regression estimators. Surveys of attitudes and opinions. Attitude scaling. Sample surveys in business, marketing and auditing.

**STAT 2222(3) - OPERATIONAL RESEARCH**

An introduction to Operational Research. Linear Programming. The Theory of Simplex Method. Duality Theory and Sensitivity Analysis. Game Theory. Waiting Time Models. Non Linear Programming. Queuing Theory. Inventory Theory.

**ECON 2190(3) - MANAGERIAL ECONOMICS I**

Introduction to Managerial economics. Demand analysis and consumer theory. Production and costs: the traditional theory of firms, theories of oligopoly, alternative theories of the firm. Pricing Policy and practices.

**MGT 2060Y(3) - MARKETING MANAGEMENT**

Nature and Scope of Marketing; The Marketing Environment; Marketing Research and Marketing Information Systems; Buyer Behaviour Segmentation, Targeting and Positioning Framework; Marketing Mix: Product and Services, Place (channel decisions and channel intermediaries), Price (pricing considerations and pricing methods), Promotion (Advertising, Personal Selling, Public Relations, Sales Promotion, Direct Marketing & Sponsorship); The extended marketing mix; Services Marketing; Broadening the Scope of marketing: Social responsibility; Ethics; Green Marketing; Customer Relationship Management; Marketing Plan; Marketing Audit, (Analysing Industry Attractiveness, BCG Model, Strategic Planning & Control, Review of Marketing Mix Strategies).

**MGT 2064Y(3) - MARKETING COMMUNICATIONS**

Marketing Communications - an overview, Relationship Marketing and integration of Marketing Communications, Choosing Marketing Communication agencies, Creativity and creative strategies and tactics, Media and media planning, Sales promotion, Direct marketing, Public relations, Sponsorship, merchandising and the role of packaging and branding, Support media, Internet and interactive media, Regulation of Advertising and Promotion, Evaluating the social, ethical and economic aspects of Advertising and Promotion, Measuring the effectiveness of Marketing Communications program.

**MGT 3065Y(5) - STRATEGIC MARKETING MANAGEMENT**

Unit 1: Concepts and elements of strategic marketing; Market oriented organisations; Situation analysis, understanding the marketing environment, customers and competitors; Financial analysis and forecasting techniques; Strategic tools (BCG, Ansoff Matrix, etc.); Segmentation, targeting and positioning strategies; Portfolio analysis; Brand Management strategies (global marketing management concepts); Supply chain management; Pricing strategies; Integrated Marketing Communications; Strategy implementation and control Unit 2: Note: This unit of the course will focus on marketing innovations and will be conducted in a seminar format with discussions from materials compiled from various sources. E-business information including Internet marketing; e-business strategy, web project management, content management systems; usability, eCRM and interactive TV advertising; Best practices from online marketing and e-commerce; The use of social mechanism to diffuse innovations; Customer lifetime value – its measurement and applications; Pharmaceutical promotion and marketing; Integration and use of

Geographical Information Systems (GIS), Global Positioning Systems (GPS) in marketing; Professionalism and accountability in Marketing.

#### **STAT 3014Y(5) - MULTIVARIATE ANALYSIS AND BUSINESS INTELLIGENCE**

Distribution in several dimensions. Multivariate Normal distribution. Inference. Exploring multivariate data. Principal Component Analysis. Factor analysis. Discriminant Analysis. Multidimensional scaling. Conjoint analysis.

Introduction to Data Mining. Data preprocessing. Exploratory Data Analysis. *Classification*: Decision Trees and Model Evaluation, Neural Networks. *Association*: Market Basket Analysis. *Clustering*: Hierarchical and k-Means Clustering. An overview of anomaly detection.

#### **STAT 3015Y(5) - TIME SERIES ANALYSIS AND BUSINESS FORECASTING**

Examples of time series. Time series plot. Model-building strategy. Classical trend and seasonal model. Additive and multiplicative models. Decomposition. Exponential smoothing. Estimation. Forecasting using Holt-Winters method. Time series and stochastic processes. Autocovariance function. Random walk. Moving Average. White Noise. Stationarity. Models for stationary time series : general linear process, MA processes. AR processes. Invertibility. Box-Jenkins methods. ARIMA and SARIMA processes. Models for non-stationary time series. Differencing. Model specification. Properties of sample acf and pacf. Nonstationarity. AIC criterion. Model Estimation and diagnostics. Residual analysis. Box-Pierce and Ljung-Box statistics. Forecasting. Using R Statistical Language for time series analysis.

#### **STAT 3000Y(5) - DISSERTATION**

At the end of the third year of the programme, students will be required to submit a project dissertation. The title of the dissertation has to be approved by the Department of Economics and Statistics and a Project Supervisor identified by the Programme Co-ordinator. The dissertation length should be in the range of 8000–12000 words.

#### **STAT 3016Y(5) - STOCHASTIC PROCESSES AND STOCHASTIC FINANCE.**

Random variables and stochastic processes. Discrete time Markov chains (DTMC). Classification. Stationary distribution. Random walks. Simple applications of DTMC's. Counting processes and Poisson Processes. Non-homogeneous PP and Compound PP. Branching processes.

A simple market model. Risk-Free Assets. Risky Assets. Discrete Time Market Models. Portfolio Management. Brownian Motion. Stochastic differential equations. Elementary Itô calculus. The Black Scholes model.

#### **STAT 3017Y(5) - GENERALISED LINEAR MODELS AND SURVIVAL ANALYSIS**

Limitations of the general linear model. Scope and versatility of the generalised linear model. The exponential family of densities. Estimation of generalised linear models and hypothesis testing including use of relevant software. Logit, Probit, log-log and Poisson regression with business applications. Log linear analysis of multidimensional contingency tables. Multinomial response models. Survival models: Survival time. Hazard function. Cumulative hazard function. Censoring. Accelerated Life Models. Proportional Hazards Model. Exponential and Weibull Models. Time varying covariates. Time dependent effects. Business and actuarial applications.

#### **MGT 3076Y(5) - INTERNET MARKETING**

Emergence of e-marketing and e-business models, e-marketing environment and technology, Ethical and legal issues in e-marketing, Consumer behaviour and internet, Targeting online market segments, differentiation and positioning strategies, e-marketing product and pricing strategies, e-marketing communication, Customer Relationship Management and CRM benefits - CRM vision, processes, information and technology, e-marketing in emerging economies, technological readiness and the digital divide.

#### **MGT 3081Y(5) - RETAIL MARKETING**

Introduction to Retailing; Building Relationships & Strategic Planning in Retailing. Retailing Institutions by Ownership, Nonstore-Based, Web-Based, & Other Forms of Nontraditional Retailing; Information Gathering & Processing in Retailing; Trading-Area Analysis & Site Selection; Retail Organisation &

Operations Management; Merchandise Management & Pricing; Establishing & Maintaining Retail Image; Integrating & Controlling The Retail Strategy. Retail Product in Theory and Practice; Product Life Cycle in Theory and Practice; Product Portfolios; Importance, Nature and Management of the New Product Development Process; New Product Strategy; New Product Idea Generation & Screening; Concept Development and Testing; Commercialisation: Test Marketing and Launching the New Product; Managing Growth & Maturity; Controlling the Product Line.

**ECON 3131(5) – INTERNATIONAL TRADE**

International Trade Theories: Ricardian and Heckscher-Ohlin Models. Offer Curves, Trade, Imperfect Competition and Economies of Scales: Intra-Industry Trade, International Factor Movements and FDI. Intertemporal Trade. Strategies and Policies, Instruments of Protection, Effects of Protection on Trade and Welfare, Dumping.

**ECON 3182(5) – INTRODUCTION TO RISK MANAGEMENT**

Sources and Types of Risk: Hedging Techniques. Foreign Exchange Markets. Foreign Exchange Exposure. International Techniques of Managing Forex Risk: Introduction to Forward and Futures Markets. Swaps: Interest Rate Currency and Commodity Swaps. Commodity Futures. Introduction to use of Options in Risk Management.

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