BSc (Hons) Business Statistics with Finance – SH306

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 financial 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 candidates having at least a "B" in Mathematics

4.Programme Duration

	Normal	**Maximum**
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:

	Credits from			
	Core Taught Modules	**Project/ Dissertation**	**Electives**	**GEMS**
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 Finance

Code CORE	Module Name	Hrs/Wrk L+P	Credits
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
DFA 1002Y(1)	Financial Theory and Practice	3+0	6
DFA 1020Y(1)	Accounting and Financial Analysis	3+0	6
DFA 2002Y(3)	Corporate Finance	3+0	6
DFA 3006Y(5)	International Finance	3+0	6
ECON 1215(1)	Economics	3+0	3
ECON 2004Y(3)	Money, Banking and Finance	3+0	6
STAT 3000Y(5)	Dissertation	-	10
	GEM	-	6
ELECTIVES			
STAT 3016Y(5)	Stochastic Processes and Stochastic Finance	3+0	6
STAT 3017Y(5)	Generalised Linear Models and Survival Analysis	3+0	6
DFA 3234(5)	Investment Analysis	3+0	3
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 Finance

LEVEL I

Code CORE	Module Name	Hrs/Wrk L+P	Credits
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
DFA 1002Y(1)	Financial Theory and Practice	3+0	6
DFA 1020Y(1)	Accounting and Financial Analysis	3+0	6
ECON 1215(1)	Economics	3+0	3
	GEM	-	6

LEVEL II

Code CORE	Module Name	Hrs/Wrk L+P	Credits
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
DFA 2002Y(3)	Corporate Finance	3+0	6
ECON 2004Y(3)	Money, Banking and Finance	3+0	6

LEVEL III

Code CORE	Module Name	Hrs/Wrk L+P	Credits
DFA 3006Y(5)	International Finance	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
ELECTIVES	**CHOOSE 6 CREDITS FROM**		
STAT 3016Y(5)	Stochastic Processes and Stochastic Finance	3+0	6
STAT 3017Y(5)	Generalised Linear Models and Survival Analysis	3+0	6
DFA 3234(5)	Investment Analysis	3+0	3
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 intergral. 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.

DFA 1002Y(1) - FINANCIAL THEORY AND PRACTICE
The financial system; Capital markets; An Analysis of the Mechanisms of the Financial System in the economy: Theory and Current Statistics; Time value of money; Capital Budgeting: an introduction; Valuation of Financial Assets; Bond analysis: an introduction; Risk, Return and Diversification; Efficient Market Hypothesis; Multinational Finance: an introduction; Consumption, Investment and the Capital Markets; Theory of choice: utility theory given uncertainty; State Preference Theory; Objects of choice: Mean variance uncertainty; Asset Pricing Theory, Agency Theory, Portfolio Theory.

DFA 1020Y(1) - ACCOUNTING AND FINANCIAL ANALYSIS
The Role of Accounting Information; Recording and Summarising Transactions; Accounting Concepts & Preparing Final Accounts; Adjustments to Final Accounts; Capital v/s Revenue Expenditure; Bank Reconciliation Statement; Accounting Ratios & interpretation Techniques; Introduction to Group Accounting & related issues; Accounting for Internal Decision Making Techniques; Elements of Cost; Costing Methods & Techniques; Decision Making Techniques; Accounting for Manufacturers; Budgets; Regulatory Framework for Company financial Reporting; Understanding Published Annual Reports; Corporate Failures Prediction; Forecasting & Valuing Businesses; Earnings Management.

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.

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. Bookstrap & 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.

DFA 2002Y(3) - CORPORATE FINANCE
Present values and wealth; Risk and return; Capital budgeting and risk; Market Equilibrium: CAPM and APT: Theory and empirical test; Correlation structure of Security Returns; EMH and its implications in Corporate Financing; Capital Structure and Cost of Capital: Theory, Empirical Evidence and Applications; Leasing; The Dividend Policy: Theory, Empirical Evidence and Applications; Gilt-edged securities: Interest rate theory and pricing of bonds; Introduction to Options; Introduction to Financial Futures; Multinational Finance; Hedging Strategies; Mergers, Acquisition and Restructuring: Theory and empirical evidence; Treasury Management.

ECON 2004Y(3) - MONEY, BANKING AND FINANCE
Money. Money Demand and Money Supply Analysis. Principles of Financial Intermediation. Banking. Interest Rates. Financial Markets. Regulation. Central Banking. International Banking. Monetary Policy. Transmission Mechanism Models. Mauritian Financial System and Development.
Investment Decisions - Choice under Uncertainty. Term Structure of Interest Rates. Asset Pricing Models and Applications. Security Valuation. Market Efficiency and Market Anomalies. Portfolio Analysis. The Mauritius Stock Exchange.

DFA 3006Y(5) - INTERNATIONAL FINANCE
The International Monetary System; Using Balance of Payments Data; The Foreign Exchange Market; International Parity Conditions; Foreign Currency Options; Measuring and managing foreign exchange exposure; Internal and external techniques of exposure management; Interest rate exposure; Capital and Ownership structure; Global cost of capital; Capital markets and other sources of funding for the global firm; Corporate strategy and Foreign Investment Decisions; Taxation issues; Political Risk Management; Managing Multinational Operations; Working Capital Management; Import and export Financing; issues in International Finance.

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.

DFA 3234 – INVESTMENT ANALYSIS

Financial instruments, risk in investment, Risk and Returns measures, The modern portfolio theory, Portfolio Selection; the capital asset pricing model (CAPM), The arbitrage pricing theory (APT), Active v/s Passive strategy, Asset Allocation, Collective Investment Schemes, market efficiency and anomalies, Analysis of fixed income securities, bond valuation and duration, stock valuation models, dividend discount model and other related issues, security analysis, trading strategies, technical and fundamental analysis, *Sharpe and Treynor indices, investing in securitized instruments and derivatives, international financial instruments.*

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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