FSO308 Business Analytics [4 Credits]

Learning Objective: This course provides the knowledge and skills students need to manage, analyse and use data to support strategic decision making. The curriculum is designed to provide students with ability to develop statistical and predictive models to support managerial, financial and operational statistics.

UNIT 1: Introduction to Analytics (12 Hours)

Introduction to Analytics – Overview – Analytics v/s Analysis – Business Analytics – Business domains within Analytics – Summarizing Data – data collection – data dictionary – outlier treatment – Multichannel Segmentation – Identify differences in behavior of online, in-store & multi-channel shoppers – Identify the size of the opportunity for growth and begin to identify the methods to achieve it – The value of the different shopper groups (Domain Area: Retail Analytics) Portfolio Models – Calculating Efficient Portfolios – Variance Co Variance Matrix – Estimating Beta and Security Market Line **–** Option Pricing Models – Bonds ***(Domain Area – Finance)***

UNIT 2: Linear Regression Models (12 Hours)

Linear Regression – Correlation and Regression – Multivariate Linear Regression Theory – Coefficient of determination (R2) and Adjusted R2 – Model Misspecifications – Economic meaning of a Regression Model – Bi-variate Analysis – ANOVA (Analysis of Variance) – Multivariate Linear Regression Model – Variable identification – Response variable exploration – Independent variables analyses – Heteroscedasticity detection and correction – Multicollinearity detection and correction – Fitting the regression – Model performance check ***(Domain Area: Insurance)***

UNIT 3: Logistic Regression (12 Hours)

Logistic Regression – Identifying problems in fitting linear regression on data having "Binary Response" variable – Introduction to Generalized Linear Modeling (GLMs) – Logistic Regression Theory – Logistic Regression Case – Variable identification – Response variable exploration – Independent variables analyses – Fitting the regression using SAS language – Scoring equation – Model diagnostics – Analysis of results – Score Card Development ***(Domain Area: Banking)***

UNIT 4: Decision Tree, Clustering & Time Series Modelling (12 Hours)

Decision Tree & Clustering – Data Mining and Decision Trees – Decision Tree Example – CHAID analysis – Method and Algorithms – Running the CHAID analysis and Interpreting the results – CART – Method and Algorithms – Running the CART analysis and Interpreting the results – When to use CART and when to use CHAID – Defining Clustering – Why and Where to use Clustering – Clustering methods – Clustering example – K-means Clustering Algorithm (Domain Area : Insurance / Banking) Time Series Modeling – Models of time series – Moving averages – Autoregressive Models – The Box- Jenkins model building process – Model Estimation – Model Validation – Model forecasting – Identify the ARIMA model – Estimate the best ARIMA models – Validate the model – Forecast the sales based on model ***(Domain Area : Automobile)***

UNIT 5: Association Rule and Apriori Algorithm (12 Hours)

Logistic Regression – Identify and develop Dependent variable – Perform initial variable reduction and missing value imputation – Perform extreme value treatment – Prepare correlation matrix and VIF chart – Variable reduction through Multicollinearity – Perform Binning to prepare modeling dataset – Perform sampling to prepare training and validation dataset Run the model – Develop report for model outcomes – Write the Scoring or implementation strategy ***(Domain Area: Telecom Industry)*** Association Rule – Affinity analysis to understand purchase behavior – Understanding Apriori algorithm – Capturing the insightful association available in the transaction records – Analysis of output results to plan store layout, promotions and recommendations

Suggested Readings:

1. Michael Minelli , Michele Chambers , Ambiga Dhiraj , Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses, John Wiley and Sons, Hoboken ,New Jersey, 2013.
2. R.N Prasad, Fundamentals of Business Analytics, Wiley India Pvt Ltd, 2012