2017

COURSE BOOK

MBA Data Analytics

(MBA DA)

School of Management

Centurion University of Technology& Management

Preface

The growth of structured and unstructured data has generated high volume of jobs in data analytics sector. The MBA Data Analytics course is designed in such a way that it gives complete insight in current happening in technology sector and also make students job ready for this highly paying job sector.

Programme Objectives
- Understand concepts of data warehousing and business intelligence
- Extraction, Transformation and Load and also understanding of various current business intelligence tools
- Structured and Unstructured data analytics using techniques such as Big Data and NoSQL
- Statistical and Predictive analysis using R and Python

Career Opportunity:

Huge job market in Data Analytics and Big Data technologies. The current trend is senior experience IT professionals are also moving to this field. This course will give students a first mover advantage.

Eligibility:

BE in any branch, B Sc/M Sc in Physics, Maths, Computer Diploma after Graduation

Programme Structure:

The two year program is having 4 semester out of which first two semesters are theory and labs and last two semesters are covering industry internship keeping CUTMs philosophy in mind of industry exposure is part of the curriculum. Total credit: 106

Scheme of Examination:

Internal Examination: 40%

University End-semester examination: 60%

MBA DA COURSE OUTLINE (2017)

Total Credits:
COURSE STRUCTURE:
First year of study: 54

SEMESTER-I

Total Credit = 24

Paper Code	Subject	(L+T+P) (24 Credit)	Credit
MGDA1101	Business Economics	4+0+0	4
MGDA1102	Financial Accounting	4+0+0	4
MGDA1103	Individual and Group Behaviour	2+0+0	2
MGDA1104	Managerial Analysis and Communication – I	0+0+2	2
MGDA1105	Quantitative Analysis	4+0+0	4
MGMK1107	Marketing Management & Analytics	4+0+0	4
MGDA1106	Basics of Data Warehousing and Business Intelligence	3+0+1.5	4
Total			24

SEMESTER-II

Total Credit = 30

Paper Code	Subject	(L+T+P) (24 Credits)	Credit
MGDA1209	Advance Business Communication	2+0+0	2
MGDA1210	Information System in Business	3+0+1.5	4

MGDA1215	ETL , Data modeling and Cube Design	2+0+3	4
MGDA1216	Data Visualisation with Power BI and Tableau	2+0+3	4
MGDA1213	Unstructured Data Analytics & Machine Learning	4+0+3	6
MGDA1214	Advanced Data Modelling & Mining with R	2+0+3	4
MGDA1200	**Project** (*Project Mode in Organization*)	0+0+9	*6*
Total			*30*

Second Year of Study: 52

SEMESTER-III

Total Credits: 26

Paper Code	Subject	(L+T+P)	Credit
MGDA2100	Internship at Industry-I	0+0+39	26

SEMESTER-IV

Total Credits: 26

Paper Code	Subject	(L+T+P)	Credit
MGDA2200	Internship at Industry-II	0+0+39	26

Course Curriculum

SEMESTER -1

Paper 1   **Business Economics**   **(4 Credit)**
               Code: MGDA1101

Course Objective:
The primary objective of this course is to develop an understanding of different microeconomic and macroeconomic concepts and learn their applications in the process of development and business decision making.

Curriculum:

Module: 1   The firm and its goal, Analysis of demand and supply, Analysis of elasticity, Estimation and forecasting of demand function, Estimation of production and cost function

Module: 2   Breakeven analysis, Market structure, conduct and performance including perfect competition and economic efficiency, monopoly, allocative efficiency, oligopoly;

Module: 3   Pricing methods covering pricing of multiple products, employment inputs, Taxes and subsidies, and price controls, National income accounting; growth and development; conceptualization of inflation; unemployment and poverty as central endogenous macroeconomic variables;

Module: 4   Fiscal and monetary policies, Understanding of government budgets, Economic reform and structural adjustment programmes;

Module: 5   Implications of the policies of liberalization; privatization and globalization; economic reforms

Books Recommended:

- Managerial Economics, 4th Edition, by H. Craig Petersen and W. Cris Lewis, Pearson Education.
- Economics, 18th Edition, by Paul Samuelson, W. D. Nordhaus, Tata McGraw Hill, New Delhi.

Paper 2   **Financial Accounting**   **(4 Credit)**
               Code: MGDA1102
Course Objective:
The objective of the course is to familiarize students with basic accounting principles, concepts

and conventions for managerial decision making.

Curriculum:
Module: 1   Business and accounting environment, objectives and uses of financial statement, assumptions, characteristics and definitions of financial statements
Module: 2   Process of recognition, basis of measurement, requirements of companies' act, accounting standards, balance sheet, profit and loss account
Module: 3   Cash flow statement analysis, accounting process
Module: 4   Financial reports, inventory valuation, fixed asset accounting
Module: 5   Accounting for depreciation, financial statement analysis

Books Recommended:
- Financial Accounting for Management, by N. Ramachandran and Ram K. Kakani, Tata McGraw Hill, New Delhi.

Paper 3   Individual and Group Behaviour   (2 Credit)
Code: MGDA1103

Course Objective:
The objectives of the course are to understand the dynamic of individual, interpersonal and group behavior in organizational setting, develop students' knowledge and competence to deal with human problems of management and developing students' awareness and insight for personal and professional growth.

Curriculum:
Module: 1   Behaviour of individuals and small groups
Module: 2   Learning
Module: 3   Perceptual processes, Beliefs; attitudes and values
Module: 4   Personality; attribution; self-concept; motivation; leadership; active listening; interpersonal communication and interpersonal conflicts
Module: 5   Management of stress at workplace

Books Recommended:
- Organisational Behaviour, by Steven L.McShane and Mary Ann Von, Tata McGraw Hill, New Delhi.

Paper 4   Marketing Management and Analytics   (4 Credit)
Code: MGDA1104

Course Objective:
The objective of the course is to make the students understand the basic concepts of marketing.

Curriculum:

Module: 1   Introduction to Marketing Theory, managerial action frameworks- marketing concept; 4 Ps; and 4 Cs, components of marketing strategy- product; price; promotion and distribution; related illustrations; viewpoints and caselets.

Module: 2   Integrative concepts like positioning; segmentation; branding, advertising campaigns and marketing planning.

Module: 3   Marketing processes such as supply chain, customer relationship, e-marketing or market knowledge management that are needed to achieve organisation's desired performance,

Module: 4   How sales is different from marketing? How Sales & Marketing is interrelated?

Module: 5   Usage of analytics in sales & marketing.

Books Recommended:
● Marketing Management – A South Asian Perspective, by Kotler, Keller, Koshy and Jha, Pearson Education, New Delhi

Paper 5   **Quantitative Analysis**   **(4 Credit)**

                      Code: MGDA1105

Course Objective:
The course is intended to help management students to appreciate the relevance of the use of quantified facts in the complex world of development and business decision making. The emphasis is on conceptual understanding of the basic mathematical and statistical tools and techniques and its meaningful applications.

Curriculum:

Module: 1   Descriptive Statistics: Regression Analysis, Assumptions of OLS Regression, Regression Modelling. Correlation, ANOVA, Forecasting, Heteroscedasticity, Autocorrelation, Introduction to Multiple Regression.

Module: 2   Statistical Inference & Regression Analysis: Need for Business Modelling, Regression – Concepts, Blue property-assumptions-Least Square Estimation, Variable Rationalization, and Model Building etc.

Module: 3   Excel as a tool to analyze quantitative data -Lab

Module: 4   Excel Workshop on various operations including VBA Programming – Lab

Module: 5   Usage of statistical functions in xls - Lab

Books Recommended:
- Statistics for Management, R. I. Levin and D. S. Rubin, 7th Edition, Pearson Education.
- Fundamentals of Statistics, S. C. Gupta, Himalaya.

Paper 6   Managerial Analysis and Communication – I   (2 Credit)

Code: MGMK1107

Course Objective:
It will also help students to develop their written and oral communication ability.

Curriculum:

Module: 1   Business communication including forms and media

Module: 2   Types, barriers, ethical dilemma, three step processes of written communication (planning, writing and completing)

Module: 3   Group dynamics, basics of teamwork

Module: 4   Nonverbal and verbal communication, presentation skills

Module: 5   Group discussion and interview techniques

Books Recommended:
- Oxford Guide to Writing and Speaking, by John Seely, Oxford University Press
- Business Communication Today by Bovee, Thill and Schatzman, Pearson Education

Paper 7   Basics of Data Warehousing and Business Intelligence   (4 Credit)

Code: MGDA1106

Course Objective:
It will also help students to understand BI & Data Analytics Concept.

Curriculum:

Module: 1   What is BI & DW, DW and BI use

Module: 2   DW/BI Architecture, DWH Project Life Cycle

Module: 3   Data Integration and Transformations

Module: 4   Data Visualizations

Module: 5   Sample Project Lab

Books Recommended:

- Toolkit books on Data Warehousing by Margey Ross

- The Data Warehouse Toolkit by Ralph Kimball

SEMESTER 2

Paper 1   **Advance Business Communication**   **(2 Credit)**
                 Code: MGDA1209

Course Objective:
The objective of this course is to help students to enhance their written, presentation and oral communication abilities and develop the art of listening.

Curriculum:

Module: 1   Communication styles; Symbols and signs; Verbal and nonverbal communication, Listening & hearing;

Module: 2   Advanced Business communication including various modes of communication like conference calls, Video conferences, business presentations; preparing for client meetings; interactive oral and interpersonal communication skills important to managers (lab/workshop);

Module: 3   presenting to a hostile audience, running meetings, listening, and contributing to group decision-making;

Module: 4   Cross-cultural communication(lab/workshop);

Module: 5   How to make business PPT & sales collateral? (lab)

Books Recommended:
- Oxford Guide to Writing and Speaking, by John Seely, Oxford University Press
- Business Communication Today by Bovee, Thill and Schatzman, Pearson Education

Paper 2   **Information System in Business**   **(4 Credit)**
                 Code: MGDA1210

Course Objective:
This course will introduce the fundamental concepts of information systems and how they support management and operations in the modern business environment. The spectrum of information technology tools used in business will be discussed, along with selected applications. The roles of technology and eBusiness across various business disciplines will be examined. Topics will include strategic applications of technology, technology trends, management of information resources, integration of business processes through Enterprise Resource Planning systems, e Business models and strategies, building and protecting information systems and others.

Curriculum:

Module: 1   Describe the basic concepts, terminology, and principles of information systems and, Recognize their importance to the success of any organization.

Module: 2   Describe the potential capabilities, use, and application of different types of information systems within an organization.

Module: 3   Identify the major methodologies/challenges involved in building/acquiring and using information systems.

Module: 4   Account S/W like Tally or efront Accounting or similar application work through - Lab, Purchase S/W efront Accounting or similar application walkthrough-Lab, Store & Inventory Management efront Accounting or similar application walkthrough -Lab

Module: 5   Understand HRIS applications like Orange HR or similar application – walkthrough -Lab, Understand Sales application like Salesforce-Lab

Books Recommended:
- Management Information Systems: Managing the Digital Firm by Kenneth C. Laudon.
- Fundamentals of Information Systems by Ralph Stair

Paper 3   **ETL, Data Modeling and Cube Design**   **(4 Credits)**
                  Code: MGDA1211

Course Objective:
The objective of this course is to help students to use ETL tools & concepts.

Curriculum:

Module: 1   ETL Overview, OLTP vs Data Warehousing, What Is ETL? , The Evolution of ETL Solutions , ETL Building Blocks , ETL ELT and EII , Virtual Data Integration , Data Integration Challenges, ETL Design, Data Acquisition, Design for Failure, Change Data Capture, Data Quality, Data Profiling , Data Validation, ETL Tool Requirements, Various ETL tools overview, ETL in big data/Hadoop solution overview

Module: 2   KETTLE/Pentaho ETL CONCEPTS (Lab) The Building Blocks of Kettle Design, Transformations, Jobs, Transformation or Job Metadata, Database Connections, Tools and Utilities, Repositories, Virtual File Systems, Parameters and Variables, Installation and Configuration, Kettle Software Overview, Installation, Installing Kettle, Configuration, The Rental Star Schema, Prerequisites and Some Basic Spoon Skills, Setting Up the ETL Solution, Working with Spoon, The Sample ETL Solution, The Sample ETL Solution overview.

Module: 3 Data Extraction, Cleansing and Conforming (Lab) - Kettle Data Extraction Overview, File-Based Extraction, Database-Based Extraction, working with ERP and CRM Systems, Data Profiling Using eobjects.org Data Cleaner, CDC: Change Data Capture, Data Cleansing, Data-Cleansing Steps, Using Reference Tables, Data Validation, Error Handling, Auditing Data and Process Quality, Data Deduplication.

Module: 4 Handling Dimension Tables & Loading Fact Tables (lab) -Managing Keys: Managing Business Keys, Loading Dimension Tables, Snowflake Dimension Tables, Star Schema Dimension Tables, Slowly Changing Dimensions, Generated Dimensions, Junk Dimensions, Recursive Hierarchies, loading in Bulk, Dimension Lookups, Maintaining Referential Integrity, Scheduling, Monitoring, Versioning and Migration

Module: 5 Overview of OLAP concept & architecture , Overview of dimensional models & cubes, Preparing the data for OLAP cubes , Role of Meta Data in modelling, Designing the Dimensional Model – Star Schema & Snowflake

Books Recommended:
- Data Extraction, Management and Analysis by Nhung Do
- Data warehouse Aggregates: Solutions for Star Schema Performance by Christopher Adamson
- Pentaho for Big Data Analytics by Manoj Patil and Feris Thia

**Paper 4   Data Visualization with Power BI and Tableau   (4 Credit)\
               Code: MGDA1212**

Course Objective:

The objective of this course is to help students to develop visualization tools & concepts.

Curriculum:

Module: 1 Introduction to PowerBI, Understanding the data model, Using OLAP tools and converting to formulas, Understanding Power BI and Tableau, Loading data from external sources, Other tools like Power BI and Tableau

Module: 2 Creating charts and Dashboards in PowerBI and Tableau

Module: 3 Understanding PowerBI calculations, understanding calculated columns and fields, Handling errors in PowerBI expressions, Formatting PowerBI and Tableau code, Common PowerBI functions, Understanding Calculate, hierarchies in PowerBI and Tableau

Module: 4   Deployment in PowerBI and Tableau

Module: 5   Shaping the reports & Performing date calculations in PowerBI and Tableau, Key Performance Indicators (KPIs), Creating data models for PowerPivot, Understanding PowerPivot metadata, defining sets, creating dynamic sets with MDX, using perspectives, understanding drill-through, building a calendar table, Aggregating and comparing over time, Closing balance over time, Computing moving averages, Banding, Ranking, using many-to-many relationships, Implementing basket analysis

Books Recommended:
- Data Visualization by Andy Kirk
- Interactive Data Visualization for the Web by Scott Murray

Paper 5   **Unstructured Data Analytics, Machine Learning, Social Media and Web Analytics**   **(4 Credit)**
                Code: MGDA1213

Course Objective:

The objective of this course is to help students to understand unstructured data analysis & machine learning and social media and web data analytics

Curriculum:

Module: 1   Descriptive statistics for all the variables and observer the data ranges, Outlier detection and elimination, Statistical Inference & Regression Analysis overview, Hypothesis testing and determining the multiple analytical methodologies, Statistical Forecasting, Predictive Analytics, Prescriptive Analytics Overview

Module: 2   Description and Resolution - Collective Reasoning, Machine learning methods drive much of modern data analysis for commercial applications. Try search engines, recommender systems, advertisers, and financial institutions employ machine learning algorithms for content recommendation, predicting customer behaviour, compliance, or risk using R -Lab

Module: 3   Key insights underlying the tools, what kinds of problems they can/cannot solve, how they can be applied effective using R, Effective tools for using unstructured and semi-structured text. This course examines a suite of key machine learning tools and their applications, including predictive analysis.

Module: 4   Inside the search engine - Examples of intelligent web applications - Basic

elements of intelligent applications like data mining – Searching, Reading, indexing, and searching, Streams, Information and Language, - Statistics of Text - Analyzing Sentiment and Intent – Load - Databases and their Evolution, Big data Technology and Trends.

Module: 5 An overview of clustering - Clustering issues in very large datasets - The need for classification - Automatic categorization of emails and spam filtering - Classification with very large datasets - Comparing multiple classifiers on the same data, Demographic Prediction, Search Funnels, Keyword Forecast, Traffic, Keyword "expansion" (create a long tail, arbitrage)

Books Recommended:

- Statistics for Management, R. I. Levin and D. S. Rubin, 7th Edition, Pearson Education
- Statistical Forecasting by J.S. Armstrong
- Applied Predictive and Descriptive Analytics by Dean Abbott
- Marketing Research: Tools and Techniques by Nigel Bradley
- Social Media Analytics by Marshall Sponder

Paper 6 **Advanced Data Modelling & Mining with R** **(4 Credit)**
     Code: MGDA1214

Course Objective:

The objective of this course is to help students to understand predictive & prescriptive modeling tools

Curriculum:

Module: 1 Introduction to R Starting with R, R Objects, Vectors, Factors, Generating Sequences, Sub-Setting, Matrices and Arrays, Data Frames, Creating New Functions, Objects, Classes, and Methods, Managing Your Sessions, Loading the Data into R, Data Visualization and Summarization, Unknown Values, Obtaining Prediction Models, Model Evaluation and Selection, Predictions for the Seven Algae, The Available Data, Defining the Prediction Tasks,

Module: 2 The Prediction Models, From Predictions into Actions,

Module: 3 Model Evaluation and Selection. Detecting Fraudulent Transactions & Classifying Microarray Samples, Problem Description and Objectives, The Available Data, The Available Data,

Module: 4 Obtaining Outlier Rankings, Semi-Supervised Approaches,

Module: 5   Brief Background on Microarray Experiments, Gene (Feature) Selection, Predicting Cytogenetic Abnormalities, The Modeling Techniques

Books Recommended:
- Data Modelling: Theory and Practice by Graeme Simsion
- Data Modelling Fundamentals by Paulraj Ponniah
- Principles Of Data Mining by D.J.Hand, Heikki Mannila and Padhraic Smyth
- Data Mining and Analysis by Mohammed Zaki and Wagner Meria
- Data Mining Applications R by Luis Torgo
- R and Data Mining by Zhao Yangchang

Paper 7.   **Project**   **(6 Credits)**
               Code: MGDA1200

SEMESTER 3

Paper 1   **Industry Internship and Project – I**   **(26 Credit)**
               Code: MGDA2100

SEMESTER 4

Paper 2   **Industry Internship and Project-II**   **(26 Credit)**
               Code: MGDA2200

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