School of Management Studies

Programme Specification

Title: **Master of Business Administration (MBA) in Business Analytics**

Final Award: **Master of Business Administration (MBA) Business Analytics**

To be delivered from:

Level	Date
Master of Business Administration (MBA)	2016-18

(According to University Grant Commission, Government of India

CHOICE BASED CREDIT SYSTEM)

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1. Basic Programme Data

Final Award: Master of Business Administration (MBA)

Programme Title: Master of Business Administration (MBA) in
                                                          Business Analytics

Exit Awards and Titles   Master of Business Administration

Subject(s)   Business Analytics

Mode(s) of delivery   Full Time

Is there a Placement?   Yes

Is there an Exchange?   No

Awarding Body   Jagran Lake city University

Campus (s)   Bhopal

School(s)   School of Management, JLU

Regulatory Umbrella   University Grants Commission,
                                                          Government of India

Format & Assessment Benchmark   Choice Based Credit and Grading System
                                                          with effect from the Academic Year 2016–
                                                          2018 for Semester I to IV

Programme Start Date   ___ _____ 2016

Total Credits – 100

2. Programme Description

2.1 Overview

Most industry sectors have recognized the value that Business Analytics can provide in not only driving compelling Business Solutions, but also in helping them to differentiate themselves to customers, investors and regulators. The global Business Analytics is a USD 105 billion market, growing at a CAGR of 8%. India, with its surfeit of talent, has become the Analytics hub for organizations across the world. Large corporate like Walmart, Target, Citibank, ICICI Bank, Airtel, Vodafone are increasingly adopting analytics in their processes. Consulting giants like PwC, IBM, Accenture, Infosys have large teams offering Analytics solutions to their clients. All of these translate into a huge global and domestic demand for Business Analytics professionals.

The curriculum is designed to expose students to facets of Management – Marketing, Finance and HR with strong skills in Business Analytics.

The program will develop a deeper sense about management principles and techniques in the field of marketing, finance, quantitative analysis and entrepreneurship. They will also equip themselves with adaptive thinking which is applicable in the management domain.

Students will learn special skill sets for application of Business Analytics in the field of management. Computational skills are vigorously focused in the program.

A reasonable mix of common courses with core courses will make them self-directed on the path of continuous learning. Core courses will make them capable to apply analytics in specific areas and then to effectively communicate to the stakeholders of given management challenge.

A good Data Scientist or Business Analyst is supposed to work effectively and efficiently in the individual capacity and as a team. The program delivery will in-built these skills and aptitude.

Students will get the updated knowledge and developments in the field of Analytics by virtue of interactions with learned industry professionals and academicians.

2.2 Aims and Objectives

The comprehensive Analytics program has been designed to create complete analytics professionals. It has been designed by experts with inputs from several analytics companies. The program will train the students in two specific domains.

I. First, they will understand basic management concepts related to marketing, finance and entrepreneurship

II. Secondly they will attain the special skill sets for applying Analytics in the management areas.

3. Programme Outcomes

Programme-level learning outcomes are identified below.

3.1 Knowledge and Understanding

On successful completion of this programme a student will have knowledge and understanding of:

1. The business foundation concepts like organisational behaviour, HRM, Financial Management, Consumer Behaviour Management with case studies.

2. The fundamentals of DBMS and SQL, and how to leverage them for maximising individual and organisational effectiveness.

3. The details of spreadsheet analysis

4. The basic statistical concepts like descriptive statistics, probability, probability distribution, sampling distributions, hypothesis testing, measures of association and regression analysis.

5. The fundamental concepts of applied statistics like statistical quality control and index number.

6. How to find an optimal solution with the help of the concepts of operations research.

7. Various multivariate statistical techniques like multiple linear regressions, logistic regression, dimensionality reduction techniques like principal component analysis and factor analysis.

8. Data mining techniques like CART, CHAID, Random Forest, Association Rules Mining, Artificial Neural Network, and Support Vector Machines.

9. Univariate and multivariate Time Series Econometrics.

10. The modern concepts of data visualization

11. The concepts of big data and how to analyse it using HADOOP

12. The concept of fraud, credit risk, customer segmentation, text mining, mobile analytics and survival analytics.

3.2 Subject Specific Intellectual Skills

On successful completion of this programme a student will be able to:

1. Develop competence in a specialist area in Analytics

2. Develop business understandings and gain insights through data

3. Develop appropriate programing skills to communicate with the data

4. Develop thinking ability to analyse a problem and take it to the right direction

5. Experiment with various analytical techniques to come up with the optimal solution.

6. Develop descriptive, predictive and prescriptive analytical skills.

3.3 Subject Specific Practical Skills

On successful completion of this programme a student will able to:

1. Write programming in R and utilize various R data analytics packages for analysis.

2. Do predictive analytics using SAS Enterprise Miner

3. Write SQL Queries to extract information for Business Intelligence.

4. Perform Big Data Analytics using HADOOP.

5. Create Business dashboard using TABLEAU

6. Make daily analysis using EXCEL

7. Plan and undertake independent academic research, utilising a variety of methodologies thus demonstrating appropriate research skills for the completion of an in-depth and original dissertation.

3.4 Transferable Skills and Attributes

1. Critically analyse data and write detailed report based on it.

2. Ability to identify problems faced with data and make necessary transformation and cleaning to make the data fit for analysis.

3. Be self-reflective and give and receive constructive criticism

4. Communicate sophisticated theoretical approaches effectively and appropriately in oral, written and technical contexts

5. Function effectively in a team, taking on responsibilities, including leadership roles, and anticipating problems and difficulties.

6. Plan, research and undertake ambitious, independent research projects.

7. Decision making ability based on the business perspective.

4. Indicative Content

The following modules are covered over a span of four semesters (Two years) of post graduate program.

1. **Organizational Behaviour and HRM**: To introduce the idea of how individual behaviour affects organizational behaviour and vice versa; to help the students understand the crucial role of people in any business and to explore different aspects of building this vital capability.

2. **Marketing Management**: To provide an introduction to the aspects of marketing such as marketing planning, marketing research, product planning and development, promotion planning, distribution and pricing. It provides an understanding of the theories of the marketing mix variables, and a practical application in the context of the marketing management cycle processes of research, planning, organization, implementation and control.

3. **Accounting for Managers**: The objective of this subject is to familiarise the students with the management accounting concepts, the financial accounting process, preparation of final accounts/reports, interpretation of financial statements, sources uses of funds, financial analyses, cost analysis and their applications in managerial decision making, budget planning and its control, different types of ratios and its application.

4. **DBMS and SQL**: The subject gives an understanding on how technology and architecture collaborate together to serve the business requirements of different users in the organization. The course predominantly explains the importance of data management in the organization for transactional and analytical objective. The

operational data from database management systems are used for day-to-day business transactions and serve the users on current information. This subject enables the students to the fundamentals of DBMS and SQL, and how to leverage them for maximising individual and organisational effectiveness.

5. **Spreadsheet Analysis**: This course will cover all aspects of creating spreadsheet, performing calculations, formatting, some very widely used formulas like SUMIF, LOOKUPS, and also getting Excel to make decisions using the 'IF' function, "WHAT IF ANALYSIS" and conditional formatting. It will enable the students to create, build and customise graphs, develop advanced solutions on the worksheet and to assemble the proper Excel tools.

6. **Business Statistics** - I : The objective of this subject is to give students a conceptual introduction to the field of statistics and its many applications. This is to enable the students to familiarise themselves with descriptive statistics, probability and sampling distributions, hypothesis testing for numerical variables.

7. **Financial Management**: At the end of this subject, student will:
Familiarize with fundamental concepts of Financial Management like Objectives of Financial Management, Time Value of Money, Cost of Capital, Valuations and Capital Budgeting, Capital Structures and Dividend Policies. All these concepts will be explained with the help of case studies and live data.

8. **Economic Analysis for Business Decisions**: The objective of this subject is to familiarise the students with the basic principles of economics, tools and techniques of Economics and application of the same in the competitive business world. The students will understand the determinants of demand for basic goods, production decisions under various time periods, market structure.

9. **Financial Markets and Instruments**: The objective of this subject is to help the students to understand the macro process and system of Indian Financial Markets at the broader level by exposing them to concepts such as credit creation, productive ventures, money management by government through RBI, money supply, liquidity, lending, borrowing and facilitation of credit on demand, issuers and subscribers and generation of income for lenders on short term and long term basis; further students would be exposed to raising risk capital, role of angel, venture capital and private equity investors and their exits through IPOs with the help of merchant bankers; secondary market concepts on trading and investing processes; risk management

through hedging in derivatives markets; concepts of mutual funds; securitization; credit rating requirements; role of RBI, SEBI as market regulators.

10. **Business Statistics II:** The objective of this subject is to give students a conceptual introduction to the field of statistics and its many applications. This is to enable the students to familiarise themselves with the concepts of hypothesis testing for categorical variables, testing for normality, forecasting, nonparametric methods, measures of association and regression and some important additional topics like statistical quality control and index number.

11. **Operations Research**: Management Science, an approach to decision making based on scientific method, makes extensive use of quantitative analysis. The purpose of this course is to provide students with a sound conceptual understanding of the role that management science plays in the decision-making process.

12. **Introduction to R Programming**: The objective of this course is to help you master the basics of R. In all these five units, you will cover its basic syntax that will make you ready to undertake your own first data analysis using R. Starting from variables and basic operations, you will learn how to handle data structures such as vectors, matrices, data frames and lists. We will further dive deeper into the graphical capabilities of R, and create your own stunning data visualizations. This course will also help you learn to build your own descriptive analysis and gain insight about the population through statistical inference.

13. **Consumer Behaviour and CRM**: Objective of this course on Consumer Behaviour and Customer Loyalty is to present a comprehensive coverage of the subject with examples from the Indian Scenario. This course also challenges students to understand the complexities of consumer needs and perceptions and translate them into effective Marketing Strategies. The course will be focusing on real life case-studies from Indian environment.

14. **Data Mining – I**: At the end of this course, students will be able to communicate with their own data, find the variables that are most central to their observation, learn various modeling techniques including some very famous data mining techniques like CART, Random Forest, Market Basket Analysis, machine learning techniques like Graphical Model and Bayesian Network and be able to work with unstructured data.

15. **Multivariate Data Analysis:** By the end of the subject, students should be able to understand the theory behind the statistics, Select the appropriate methods in function of the research question, Apply those methods to their data, Interpret and report the results from the analysis, Develop critical thinking of statistics

16. **Time Series Econometrics:** By the end of the subject, students should be able to:

    - Familiarize with Univariate and multivariate models of stationary and nonstationary time series in the time domain.

    - Develop a comprehensive set of tools and techniques for analyzing various forms of univariate and multivariate time series, and for understanding the current literature in applied time series econometrics.

    - Survey some of the current research topics in time series econometrics.

17. **Data Visualization:** By the end of the subject, students should be able to construct their own data visualization using Tableau and R, differentiate between exploration and visualization, understand various visual encodings, develop techniques for visualizing time, visualize statistical models and build models using visualization.

18. **Strategic Management:** To expose the students to elements of business strategy - the science & art behind this and learning from the masters of sound & creative strategic thinking and to expose the students to the fundamentals of long term & strategic thinking; to explore the various scenarios that could emerge & evaluate their respective advantages & drawbacks; scanning & identifying opportunities; strategy formulations as well as implementation.

19. **Data Mining – II:** At the end of this Subject, students will:

    - Explain what the goals and objectives of data mining are and how to conduct a data mining project.

    - Have sound knowledge of popular classification techniques, such as decision trees, support vector machines and nearest-neighbor approaches.

    - Familiarise with Machine learning models

20. **Big Data Analytics:** By the end of the course, the student will be able to:

    - Deploy a structured lifecycle approach to data science and big data analytics projects.

    - Select techniques and tools to analyze big data and create statistical models.

21. **Predictive Modeling using SAS:** By the end of the subject, students should be able to:

- familiarise with the concepts of a SAS Enterprise Miner project and explore data graphically.
- modify data for better analysis results.
- build and understand predictive models such as decision trees and regression models.
- compare and explain complex models.
- generate and use score code.
- apply association and sequence discovery to transaction data.
- use other modeling tools such as rule induction, gradient boosting and support vector machines.

22. **Advanced Analytics:** By the end of the subject, students should be able to:
- gain an understanding of how managers use business analytics to formulate and solve business problems and to support managerial decision making.
- become familiar with the processes needed to develop, report, and analyze business data.
- Work with various real world business problems.
- Understanding the concept of fraud, credit risk, customer segmentation, text mining, mobile analytics and survival analytics.

5. Learning, Teaching and Assessment Strategies

5.1 Learning & Teaching

The comprehensive Analytics program is delivered by practitioners who have rich experience in the analytics field. Teaching and learning is undertaken through classroom based lectures, seminars and assignments, workshops and case studies. The Program includes TWO major projects plus Assignments and Case Studies in all modules. After 1st year, all students will go for summer internship for 1.5 to 2 months in *analytics* firms. There, students will learn the actual application of analytics straight from the practitioners. In their final year, students will do a project work with live Big Data and apply learnt techniques under the supervision of learned faculties.

The program uses a case-based approach to learning. Students will work on multiple case studies as part of the course. The case studies will involve hands-on experience on huge datasets. We use learning by doing pedagogy.

In this program, students will be trained in most popular software's used in Business Analytics: (1) SAS (Developed by Statistical Analysis System, SAS-Institute, USA) (2) IBM-SPSS (Statistical Package for Social Sciences) and (3) **R** (Developed by **R**oss Ihaka and **R**obert Gentleman at University of Auckland, Newzealand). Microsoft Excel is taught with special vigor in this program.

Research Skills:

The Masters programme culminates in a major piece of independent research. A series of seminars will be devoted to research methods and students will be required to make presentations and write a proposal outlining their choice of topic.

5.2 Assessment Strategy

Assessment on the MBA Business Analytics utilises a variety of methods to achieve the specified learning outcomes. The major portion of assessment is continuous and consists of the following Learning & Teaching methods:

- Class Test
- Quizzes
- Assignments
- Presentation
- Group Discussion
- Case studies reviews
- Projects

The 4 credits of subject is divided into Continuous Evaluation scheme with end semester examination being of 60 per cent while the mid semester examination being of 40 percent.

Important aspects that are assessed are:
   a. Data analysis skills and ability to write detailed report based on it.
   b. Problem identification and problem solving ability in class.

c. Presentation skills

d. Communication of sophisticated theoretical approaches in oral, written and technical contexts

e. Ability to anticipate problems and difficulties while working in a group project.

f. Decision making ability

g. The level of imaginative thinking, application and initiative in managing projects, assignments and research effectively with self-motivation.

6. Summary of Programme Modules & Credits

Semester I

Course Code	Name of Course	Lectures (L) Hours per week	Tutorial (T) Hours per week	Practical (P) Hours per week	Credits
MBABA101	Organizational Behaviour and HRM	4			04
MBABA102	Marketing Management	4			04
MBABA103	Accounting for Managers	3	2		04
MBABA104	DBMS and SQL	2	2	2	04
MBABA105	Spreadsheet Analysis	2	2	2	04
MBABA106	Business Statistics - I	2	2	2	04
Total Credits					**24**

Semester II

Course Code	Name of Course	Lectures (L) Hours per week	Tutorial (T) Hours per week	Practical (P) Hours per week	Credits
MBABA201	Financial Management	3	2		04
MBABA202	Economic Analysis for Business Decisions	4			04
MBABA203	Financial Markets and Instruments	4			04
MBABA204	Business Statistics - II	2	2	2	04
MBABA205	Operations Research	2	2	2	04
MBABA206	Introduction to R Programming	2	2	2	04
Total Credits					**24**

Semester III

Course Code	Name of Course	Lectures (L) Hours per week	Tutorial (T) Hours per week	Practical (P) Hours per week	Credits
MBABA301	Consumer Behavior and CRM	4			04
MBABA302	Data Mining - I	2	2	2	04
MBABA303	Multivariate Data Analysis	2	2	2	04
MBABA304	Time Series Econometrics	2	2	2	04
MBABA305	Data Visualization	2	2	2	04
MBABA306	Project – I*		12		06
Total Credits					**26**

*Summer Internship

Semester IV

Course Code	Name of Course	Lectures (L) Hours per week	Tutorial (T) Hours per week	Practical (P) Hours per week	Credits
MBABA401	Strategic Management	2	2	2	04
MBABA402	Data Mining - II	2	2	2	04
MBABA403	Big Data Analytics	2	2	2	04
MBABA404	Predictive Modeling using SAS	2	2	2	04
MBABA405	Advanced Analytics	2	2	2	04
MBABA406	Project - II		12		06
Total Credits					**26**

Total Credits	**100**	

7. Detailed Programme Module Grid, Credits and TLP

Semester I

Course Code	Name of Course	Lectures (L) Hours per week	Tutorial (T) Hours per week	Practical (P) Hours per week	Credits
MBABA101	Organizational Behaviour and HRM	4			04
MBABA102	Marketing Management	4			04
MBABA103	Accounting for Managers	3	2		04
MBABA104	DBMS and SQL	2	2	2	04
MBABA105	Spreadsheet Analysis	2	2	2	04
MBABA106	Business Statistics - I	2	2	2	04
Total Credits					**24**

Organizational Behaviour and HRM

Objectives:

To introduce the idea of how individual behaviour affects organizational behaviour and vice versa; to help the students understand the crucial role of people in any business and to explore different aspects of building this vital capability.

Unit 1

Introduction to work Psychology and Org. Behavior

Importance of people in an Organization. OB and the organization. Theories of work motivation [Herzberg, Maslow, Adam Equity Theory, Porter and Lawler model, Vroom] Stress and its management, Ergonomics.

Definition and concept of personality. Theories of personality [Psychoanalytical, socio-cultural, interpersonal, development, Humanistic, behaviorist, trait and type approach] Latest approach like big 5 factor theory.

Perceptual process. Factors influencing perception. Importance of perceptions in decision making. Managers and self perceptions. Johari Window. Perceptual organization: Influence of past experiences, the plasticity of perception.

Unit 2

Attitudes and Emotions

Components of attitude. [ABC Model] Effect of attitude on job satisfaction and job performance. Attitude behaviour relationship. Emotion at workplace. Emotional decisions. Emotional Intelligence.

Theories of motivation and their application for behaviour change. Special HR issues in Motivation, Extrinsic and Intrinsic level of motivation.

Issues of discrimination, Management of diversity, Glass ceiling effect, Self-fulfilling prophesy, Women and Indian society.

Unit 3
Human Resource Management

Introduction to HRM. What is HRM today? Functions of HRM. Steps involved in HR planning. Factors affecting HRP.

Sources of Recruitment. Factors affecting recruitment. Selection process. Socializing new employees. Impact of HR practices, employee behaviors/attitudes on organizational performance

Concept and theories of learning, Programmed learning, Self Instructional learning, Types and the schedules of reinforcement, Escape, Avoidance and punishment, Modeling and social learning.

Unit 4
Performance Management System

Importance of performance appraisal. Appraisal, methods. Common errors in rating.

Elements of compensation package. Pay for performance. Steps in determining compensation. Administration of compensation.

Unit 5

HR Challenges in today's workplace
External and internal factors affecting HR management.
Talent Management and Motivation
Employee retention. Downsizing and rightsizing. Diversity Management. Employee Engagement and employee relations.

Reference Books:

1. Stephen P. R., Timothy A. J. (2010).*Organizational Behaviour*. India: Pearson.
2. Pareek, U. (2011). *Understanding Organizational Behavior*. India: Oxford University Press.
3. Luthans, F. (2010). *Organizational Behavior.* Singapore: McGraw-Hill.
4. Bohlander, G., Snell, S. (2009). *Managing Human Resources*. South Western Educational Publishing.

5. Ivancevich, J.M., Konopaske, R. (2012). *Human Resource Management*. India: McGraw-Hill Higher Education.

6. Aswathappa, K. (2010). *Human Resource Management*. India. Mcgraw-Hill Education.

7. Newspapers, HR Journals and Magazines

Marketing Management

Objectives:

To provide an introduction to the aspects of marketing such as marketing planning, marketing research, product planning and development, promotion planning, distribution and pricing. It provides an understanding of the theories of the marketing mix variables, and a practical application in the context of the marketing management cycle processes of research, planning, organization, implementation and control.

Unit 1

Defining Marketing in the Contemporary Context

Marketing Concept, Importance of marketing, Scope of marketing, Changes in marketing management in the 21st Century, Tasks necessary for successful marketing management.

Developing Marketing Strategies and Plans

Customer Value Preposition, Strategic planning process and levels – Corporate planning, Strategic Business Unit planning, Marketing Plan.

Components of a modern Marketing Information System, Key methods for tracking and identifying opportunities in the macro-environment, some important macro-environment developments.

Concepts and benefits of Market Segmentation, Variables of Market Segmentation, and Identification of appropriate target market for given segment, the positioning strategies of companies' on the basis of product differentiation.

Unit 2

Competitive Dynamics

Analysis of competitors' strategies, objectives, strengths, and weaknesses, Strategies of market leaders to expand the total market and defend market share, How market challengers attack market leaders.

Unit 3

Setting Product Strategy

Characteristics and Classification of products, Management of product mix and product lines, Packaging, labeling, warranties, and guarantees as marketing tools.

Pricing Strategies for Products and services, Adapting prices to meet varying circumstances and opportunities, initiating a price change, responding to a competitor's price challenge.

Unit 4

Designing and Managing Integrated Marketing Channels

Designing a Marketing Channel system and value network, Integration of channels and management of channel conflict, Future of e-commerce.

Role of Marketing communications, Major steps in developing effective communications, Concept of Communications Mix, Integrated Marketing Communications program.

Challenges in developing new products, Organizational structures to manage new-product development, Stages in developing new products, Concept of Diffusion of Innovation.

Unit 5

The Marketing Environment

The Emerging Market Environment and implications for Marketing Strategy, Marketing Mix, Marketing Communications, Marketing Budgeting and Marketing ROI's.

Current trends in defining and describing Market Opportunities, Competition, Channels, Media and strategies to monitor, anticipate, manage and drive these for the benefit of our businesses.

Reference Books:

1. Kotler, P., Keller, K. L., Koshy, A., Jha, M. (2013). *Marketing Management: A South Asian Perspective*. India: Pearson Education.
2. Rajan, S. (2005). *Marketing Management.* India: Tata McGraw-Hill Education.
3. Karunakaran, K. (2013). *Marketing Management.* India: Himalaya Publishing House.

4. Kumar, A., Meenakshi. (2013). *Marketing Management.* India: Vikas Publishing House Pvt Ltd*.

5. Ramaswamy, V. S., Namakumari, S. (2009).*Marketing Management Global Perspective, Indian Context.* India: Macmillan India Limited.

Accounting for Managers

Objectives:

The objective of this subject is to familiarise the students with the management accounting concepts, the financial accounting process, preparation of final accounts/reports, interpretation of financial statements, sources uses of funds, financial analyses, cost analysis and their applications in managerial decision making, budget planning and its control, different types of ratios and its application.

Unit 1

Conceptual Framework

Double-entry book-keeping system, journal, ledger, posting, debits, credits, trial balance, adjusting entries, final accounts for non-corporate (manufacturing trading, PandL, B/S), company final accounts, computerised accounting.

Unit 2

Financial Statement Analysis and Interpretation

Financial statement analysis and interpretation, ratio analysis, fund flow analysis. Cash flow analysis.

Unit 3

Budgets and Budgetary Control

Concepts of budget and its advantages, functional, master and cash budget, flexible and zero based budgeting, responsibility accounting, performance budgeting.

Unit 4

Marginal Costing and Profit Planning

Absorption costing and marginal costing, direct costing, contribution, profit planning, Cost-volume-profit Analysis (CVP analysis), Break-even Analysis, Break-even charts, advantages and limitations of marginal costing, application of marginal costing technique, decisions involving alternative choices, determination of sales mix, make or buy decision, exploring new markets, discontinuance of a product line. Standard costing as a tool for control, variance analysis.

Unit 5

Depreciation Accounting and Inventory Valuation

Concept of depreciation, methods of depreciation, objectives of inventory valuation, methods of inventory valuation.

Reference Books:

1. Khan, M. Y. and P. K. Jain (2013). *Management Accounting - Text, Problems and Cases.* New Delhi: McGraw Hill Education.
2. Maheshwari, S. K., S. N. Maheshwari and Sharad K. Maheshwari. (2012). *Accounting for Management*. New Delhi: Vikas Publishing House.
3. Gupta, Ambarish. (2012). *Financial Accounting for Management: An Analytical Perspective*. New Delhi: Pearson Education.
4. Banerjee, Ashok. (2009). *Financial Accounting: A Managerial Emphasis*. New Delhi: Excel Books.
5. Horngren, Charles T., George Foster and SrikantDatar. (2007). *Cost Accounting: A Managerial Emphasis*. New Delhi: Prentice Hall
6. Alexander, David and Anne Britton. (1996). *Financial Reporting*. Boston: International Thomson Business Press.

DBMS and SQL

Objectives:

The subject gives an understanding on how technology and architecture collaborate together to serve the business requirements of different users in the organization. The course predominantly explains the importance of data management in the organization for transactional and analytical objective. The operational data from database management systems are used for day-to-day business transactions and serve the users on current information. This subject enables the students to the fundamentals of DBMS and SQL, and how to leverage them for maximising individual and organisational effectiveness.

Unit 1

Introduction to Database Management System

Purpose of Database System, Views of data, Data Models, Database Languages, Database System Architecture, Database users and Administrator, Entity, Relationship model (E-R model), E-R Diagrams, Introduction to relational databases

Unit 2

Database Design

Functional Dependencies, Non-loss Decomposition, Functional Dependencies, First, Second, Third Normal Forms, Dependency Preservation, Boyce/Codd Normal Form-Multi-valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form

Unit 3

Relational Model

The relational Model, The catalog, Types, Keys, Relational Algebra, Domain Relational Calculus, Tuple Relational Calculus, Fundamental operations, Additional Operations.

Unit 4

SQL

SQL fundamentals, Oracle data types, Data Constraints, Column level & table Level Constraints, working with Tables. Defining different constraints on the table, Defining Integrity Constraints in the ALTER TABLE Command, Select Command, Logical

Operator, Range Searching, Pattern Matching, and Oracle Function. Grouping data from Tables in SQL, Manipulation Data in SQL. Joining Multiple Tables (Equi Joins), Joining a Table to itself (self Joins), Sub queries Union, intersect & Minus Clause, Creating view, Renaming the Column of a view, Granting Permissions, - Updating, Selection, Destroying view Creating Indexes, Creating and managing User. Integrity, Triggers, Security, Advanced SQL features, Embedded SQL, Dynamic SQL- Missing Information, Views, Introduction to Distributed Databases and Client/Server Databases

Unit 5

Transactions

Transaction Concepts, Transaction Recovery, ACID Properties, System Recovery, Media Recovery, Two Phase Commit, Save Points, SQL Facilities for recovery, Concurrency, Need for Concurrency, Locking Protocols, Two Phase Locking, Intent Locking, Deadlock- Serializability, Recovery Isolation Levels, SQL Facilities for Concurrency.

Reference Books:

1. C.J. Date. *An Introduction to Database Systems*. Pearson.
2. Abraham Silberschatz, Henry F. Korth, S. Sudharshan. *Database System Concepts*, 5th Edition (2006). Tata McGraw Hill.
3. RamezElmasri, Shamkant B. Navathe. *Fundamentals of Database Systems*, 4th Edition. Pearson/Addision Wesley.
4. Raghu Ramakrishnan. *Database Management Systems*, 3rd Edition. McGraw Hill
5. Hector Garcia-Molina, Jeffrey D. Ullman and Jennifer Widom. D*atabase Systems: The Complete Book*. Pearson.

Spreadsheet Analysis

Objectives:

This course will cover all aspects of creating spreadsheet, performing calculations, formatting, some very widely used formulas like SUMIF, LOOKUPS, and also getting Excel to make decisions using the 'IF' function, "WHAT IF ANALYSIS" and conditional formatting. It will enable the students to create, build and customize graphs, develop advanced solutions on the worksheet and to assemble the proper Excel tools.

Students will gain an insight into data tables and using excel advanced look up features to automate worksheets and analysis tools to forecast figures based on a range of scenarios and use consolidation to bring together information.

The case study based training design is unique as it blends the features of the tool and usage scenarios.

Unit 1

Starting up with MS Excel

Basics Of MS Excel: The Ribbon, The levels of Command organization Excel Options, Customizing the Quick Access Tool Bar, The Excel Screen, Worksheets and Workbooks, Saving a workbook. Manipulating Rows And Columns: Inserting rows and columns within a worksheet, modifying column widths using 'drag and drop', automatically resizing the column width to fit contents. Switching between worksheets, copying or moving worksheets between workbooks, Grouping Worksheets, Protecting Worksheets and Workbooks. Working with Data- entering Data: Entering numbers and text into cells, Default text and number alignment, AutoFill. Selecting data, Copying, moving and deleting data, Formatting data: Built in and custom formats, Currency symbol, Date Percentages, Alignment of content in cell range, Cell orientation. Sorting, multiple sorting and filtering.

Unit 2

Function & Referencing

Arithmetic Functions, Absolute/Relative Cell Referencing, Mixed References, Formula Auditing Tools, Formula Error Checking, Tracing Precedents/Dependents, Goto, Naming individual or range cells, Deleting and amending named ranges, Using named

cells/ranges in formulae, Using SUMPRODUCT. Conditional Functions: SUMIF and SUMIFS, COUNTIF and COUNTIFS, AVERAGEIF and AVERAGEIFS Functions, Using FLOOR/ CEILING/ MROUND/ MOD/ QUOTIENT Functions. Text functions: MID, SEARCH, LEFT, RIGHT FUNCTIONS, TRIM, CLEAN, UPPER, LOWER, DOLLAR FUNCTIONS, SUBSITUTE. Logical functions: IF, AND, OR and NESTED IF. Date Functions: DAYS360, TODAY, NOW, NETWORKDAYS, WORKDAY,

Unit 3

Graphs and Validation Techniques

Different kinds of Graphs, Column, Pie, Bar, Area, Scatter, Data validation: Drop Down Lists, Error Alerts, Conditional Formatting.

Unit 4

Lookup Functions

Lookup Functions: BASIC VLOOKUP and HLOOKUP, IFERROR VLOOKUP, MULTIPLE COLUMN VLOOKUP, INDEX and MATCH Functions, OFFSET/ INDIRECT functions.

Unit 5

Data Analysis using Pivot Table, Filters and What If Analysis

Data Analysis using Pivot Tables: Using the Pivot Table Wizard, Changing the pivot table layout, Formatting, Grouping items, Inserting calculated fields, Pivot Table Options, Display and hide data in fields, Lay out reports directly on worksheet, Pivot Chart, Using Slicer in pivot Tables, Applying and Using AutoFilter, Creating a Custom AutoFilter, Sorting On More Than One Column, Using Advanced Filter, Using Formulas In Criteria. What If Analysis. Scenario Manager, Goal Seek, Solver.

Reference Books

1. Walkenbach, John. (2010). *Excel 2010 Bible*. New Delhi: Wiley India Pvt Ltd.
2. MacDonald, Mathew. (2010). *Excel 2010: The Missing Manual.* Sebastopol: O'reilly.
3. Ragsdale, Cliff. T. (2008). *Spreadsheet Modelling and Decision Analysis.* New York: Thomson south – western publications.
4. Monahan, George E. (2000).M*anagement Decision Making: Spread Sheet, Modelling, Analysis.* London*:* Cambridge University.

Business Statistics - I

Objectives:

The objective of this subject is to give students a conceptual introduction to the field of statistics and its many applications. This is to enable the students to familiarise themselves with descriptive statistics, probability and sampling distributions, hypothesis testing for numerical variables.

Unit 1

Descriptive Statistics

Types of data, data collection, tabulation, charts and graphs, interpreting data and visualizations, measures of location, measures of variability, Skewness and kurtosis. Applications with Minitab and Excel.

Unit 2

Probability

Sets and Venn diagram, counting: permutation and combination, experiment, sample space and events, classical probability, general rules of addition, conditional probability, general rules for multiplication, Independent events, Bayes' Theorem.

Unit 3

Probability Distributions

Discrete Probability Distributions: Binomial, Poisson, approximation of binomial to Poisson, Hyper geometric distribution. Continuous Probability Distributions: Uniform distribution, Normal Distribution, Approximation of Binominal Distribution to Normal Distribution, t distribution, chi-square distribution, F distribution. Applications with Minitab and Excel.

Unit 4

Sampling and Sampling Distributions

Introduction to sampling, why is sampling essential? Random sampling: simple random sampling, stratified random sampling, cluster sampling, systematic sampling. Non-Random sampling: Quota sampling, judgment sampling. Sampling and non-sampling error, margin of error, sampling distribution of some common statistic. Applications with Minitab and Excel.

Unit 5

Statistical Inference: Estimation for single population

Point estimation and interval estimation, using z statistics for estimating population mean, confidence interval, confidence intervals for mean, estimating sample size.

Unit 6

Statistical Inference: Hypothesis testing

Introduction to hypothesis testing, one tailed and two tailed test, type I and type II errors, Central Limit Theorem, hypothesis testing for single population mean, z test, t test, one way ANOVA.

Reference Books:

1. Anderson, David R., Thomas A. Williams and Dennis J. Sweeney. (2012). *Statistics for Business and Economics*. New Delhi: South Western.
2. Levin, Richard I. and David S. Rubin (1994). *Statistics for Management.* New Delhi: Prentice Hall.
3. Waller, Derek. (2008). *Statistics for Business*. London: BH Publications.
4. Lee, Cheng. et al. (2013). *Statistics for Business and Financial Economics*. New York: Heidelberg Dordrecht.

Semester II

Course Code	Name of Course	Lectures (L) Hours per week	Tutorial (T) Hours per week	Practical (P) Hours per week	Credits
MBABA201	Financial Management	3	2		04
MBABA202	Economic Analysis for Business Decisions	4			04
MBABA203	Financial Markets and Instruments	4			04
MBABA204	Business Statistics - II	2	2	2	04
MBABA205	Operations Research	2	2	2	04
MBABA206	Introduction to R Programming	2	2	2	04
Total Credits					**24**

Financial Management

Objectives:

At the end of this subject, student will:

- Familiarize with fundamental concepts of Financial Management like Objectives of Financial Management, Time Value of Money, Cost of Capital, Valuations and Capital Budgeting, Capital Structures and Dividend Policies. All these concepts will be explained with the help of case studies and live data.

Unit 1

Introduction to Financial Management

- Definition, meaning and role of Financial Management, Goals of Business finance, Profit Maximization vs. Wealth Maximization, Profit Maximization – Approvals and Objections, Wealth Maximization, Growth Maximization, Agency problems.
- Time Value of Money: Time line, Cash Flow Sign Convention, Calculation of Annuities, Inflation Adjusted Interest Rates, Present Value, Net Present Value, Excel Application.

Unit 2

Cost of Capital

- Cost of Debt: Irredeemable and Redeemable Debenture, Preference Shares, Common Stock; Cost of Equity: Dividend Yield Method, Dividend Yield Plus Growth Rate Method, Earning Yield Method, Realised Yield Method. Calculating Weighted Average Cost Of Capital: the adjusted-beta CAPM, APM, the Bond Yield plus Risk Premium Approach.
- Cost of Retaining Earnings, Weighted Average Cost of Capital– Meaning, Limitations and Considerations in Calculating WACC, Adjusting WACC for Risk.
- Sources of Long Term Finance, Capital Asset Pricing Model or CAPM.

Unit 3

Valuations & Capital Budgeting

- Valuation of Securities - Stocks and Bonds: Concept of Value, Features of a Bond, Bonds Values and Yields, The Expectation Theory, Valuation of Preference Shares, Valuation of Ordinary Shares.
- Meaning, Nature, Significance and Procedure of Capital Budgeting, Investment Evaluation Criteria, Discounted Cash Flow Criteria (NPV, IRR, PI), Non-discounted Cash Flow Criteria (PB, discounted PB, ARR).

Unit 4

Capital Structure Theories & Dividend Decisions

- Capital Structure: Meaning, Designing and Factors influencing Capital Structure and Optimal Capital Structure.
- Leverages: Financial Leverage, Operating Leverage, Combined Leverage, Approaches of Financial Management.
- Capital Structure theories: Net Income Approach, Net Operating Income Approach, Modigliani Millar Approach, Modern Approach to Corporate Finance in an Improvement on the Traditional Approach, Pecking Order Theory.
- Dividend Decisions, Relevance V/s Irrelevance of Dividends (Relevant Theory: Walter's Model, Gordon's Model; Irrelevant Theory: MM's Approach, Traditional Approach).

Unit 5

Working Capital Management and Finance

- Cash Management: Motives for Holding Cash, Objectives and Facts of Cash Management.

- Receivables Management: Study of Credit Policy.

- Inventory Management: Definition and Nature of Inventories, Reasons for Holding Inventories, Inventory Management Techniques: HML Analysis, VED Analysis, SDE Analysis, EOQ Analysis.

- Working Capital Finance: Concept, Meaning, Definition, Importance, types and Determinants, Operating Cycle Concept, Working Capital Finance: Factors influencing WCM Estimation, Problems on estimation.

Reference Books

1. Khan & Jain. *Financial Management*, 7th edition. TMH, 2014.

2. I M Pandey. *Financial Management*, 10th edition. Vikas Publications, 2013.

3. Van Horne and Wachowitz. *Fundamentals of Financial Management* 13th ed*. Phi Learning, 2009.

4. James C. Van Horne, Sanjay Dhamija. *Financial Management and Policy*, 12th Edition. Pearson Education, 2011.

5. Prasanna Chandra. *Financial Management,* 5th edition. Tata McGraw Hill, 2010.

6. Brigham and Erhardt. *Corporate Finance* (with Thomson One - Business School Edition), 5th edition, South Western Educational Publishing, 2013.

7. Ross, Wetfield&Jaffer. *Corporate Finance,* 8th edition, McGraw-Hill/Irwin, 2008.

Economic Analysis for Business Decisions

Objectives:

The objective of this subject is to familiarize the students with the basic principles of economics, tools and techniques of Economics and application of the same in the competitive business world. The students will understand the determinants of demand for basic goods, production decisions under various time periods, market structure.

Unit 1

Basic Concepts of Economics

Economic problems, Flow of economic activities, understanding consumer's economic behaviour (Utility, Satisfaction, indifference behaviour), Relationship between consumers Income and spending, managerial economics- a way of thinking about business.

Unit 2

Managing Demand and Supply

Law of demand, Understanding the determinants of demand for basic goods, Household durables, Luxuries, Exceptions, Constructing Demand equation, Demand elasticity.

Law of Supply, supply determinants, supply equation, concept of Equilibrium.

Unit 3

Production Costs and Business Decision

Production function, production decisions under various time periods, scale of production and managerial decision.

Types of costs and its significance in decision making, Cost related decisions under various time periods.

Unit 4

Market Structure

Firm under competitive conditions as perfect and imperfect, market characteristics, price and output determination.

Unit 5

Macro Economics in Business Decision

Government and market, National Income computation, Business cycle, inflation, Macroeconomic Policies.

Reference Books:

1. Mcguigan, James R. (2010). *Managerial Economics: Applications, Strategy and Tactics*. Mason: Cengage Learning.
2. Dean, Joel. (2008). *Managerial Economics.* New Delhi: PHI Learning Pvt Ltd.
3. Spencer, Milton H. (1973). *Managerial Economics.* Toronto: Irwin.
4. Shim Jae K. (2008). *Economic Analysis for Business and Strategic Decisions*. Singapore: Global Professional Publishing.

Financial Markets and Instruments

Objectives:

The objective of this subject is to help the students to understand the macro process and system of Indian Financial Markets at the broader level by exposing them to concepts such as credit creation, productive ventures, money management by government through RBI, money supply, liquidity, lending, borrowing and facilitation of credit on demand, issuers and subscribers and generation of income for lenders on short term and long term basis; further students would be exposed to raising risk capital, role of angel, venture capital and private equity investors and their exits through IPOs with the help of merchant bankers; secondary market concepts on trading and investing processes; risk management through hedging in derivatives markets; concepts of mutual funds; securitization; credit rating requirements; role of RBI, SEBI as market regulators.

The students would be exposed to operations as well as systems and procedures that are commonly followed in the financial markets which by learning would help them in understanding the financial markets better as eventual advisors and as investors themselves.

Unit 1

Indian Financial System and Structure

Financial Markets, Financial Assets, Financial Instruments and Financial Institutions, their role in the development of the financial system, role of government and RBI, money supply, mobilization and channelization, credit creation, utilizing mobilized funds into productive ventures, structure of G-sec market, structure of Money Market and Bond Market, instruments of lending and borrowing in the money market including participants, introduction to CBLO segment, role of Primary Dealers, institutions participation, retail participation, various short term and long term fund raising exercises by various entities on risk-free basis, understanding yield related technicalities.

Unit 2

Primary Market and Public Issue Management:

Fund raising practices in the 1980s and 1990s, SEBI regulations on fund raising from public (ICDR Regulations), role of Angel, VC and PE investors, VC and PE exits, public issue and its purpose, types of issues, role of merchant bankers, role of other intermediaries, book building process, bidding process, types of investors, basis of allotments, underwriting, listing formalities.

Unit 3

Secondary Markets

Role of stock exchanges, role of stockbrokers, secondary market mechanism, type of participants – traders and investors, index and its utility, risk management by way of collecting margins, exchange settlement procedures, trading mechanism, pay-offs and arriving at financial positions, touching upon technical analysis and fundamental analysis.

Unit 4

Derivatives Market and Risk Management:

Purpose of derivatives, concepts of futures, trading, hedging and arbitrage mechanism, margins and ledger credits, how to protect portfolios from devaluation, touching upon a few options strategies.

Unit 5

Mutual Funds and other instruments

Purpose of mutual funds, its structure, fund management basics, type of themes – debt, equity and hybrid themes, mutual fund themes, utility to investors, options available to invest, mutual fund investing v/s direct investing.

Reference Books:

1. Khan, M. Y. (2005). *Financial Services.* New Delhi: Tata McGraw Hill.
2. Bhole, L. M. (2004). *Financial Institutions and Markets– Structure, Growth and Innovations.* New Delhi: McGraw Hill.
3. Parameswaran, Sunil. (2011). *Fundamental of Financial Instruments*. Singapore: John Wiley and Sons Pte. Ltd.
4. Weiss, David M. (2009). *Financial Instruments*. New York:Portfolio Hardcover.

5. Babu, G. Ramesh. (2005). *Financial Services in India*. New Delhi: Concept Publishing Company.

Business Statistics II

Objectives:

The objective of this subject is to give students a conceptual introduction to the field of statistics and its many applications. This is to enable the students to familiarise themselves with the concepts of hypothesis testing for categorical variables, testing for normality, forecasting, nonparametric methods, measures of association and regression and some important additional topics like statistical quality control and index number.

Unit 1

Tests for Normality

Normality assessment through Histogram, Probability Plot, Q-Q Plot. Outlier's assessment. SPSS application, Normalcy tests: Shapiro-Wilk and Kolmogorov Smirnov Test of Normality.

Unit 2

Hypothesis Testing for Categorical Data

Chi-square test for goodness of fit, chi-square test of independence, chi-square test for population variance, chi-square test for homogeneity.

Unit 3

Nonparametric Methods

Related samples, Wilcoxon Signed Rank, Mann-Whitney test, Kruskal-Wallis Test, Friedman AVOVA test

Unit 4

Correlation and Regression

Analyses of Relationship, Ordinary Least Square Regression, Standard error of estimate, Adjusted R square and goodness of fit.

Unit 5

Additional Topics

Index number, statistical quality control.

Reference Books:

1. Anderson, David R., Thomas A. Williams and Dennis J. Sweeney. (2012). *Statistics for Business and Economics*. New Delhi: South Western.

2. Levin, Richard I. and David S. Rubin (1994). *Statistics for Management.* New Delhi: Prentice Hall.

3. Waller, Derek. (2008). *Statistics for Business*. London: BH Publications.

4. Lee, Cheng. et al. (2013). *Statistics for Business and Financial Economics*. New York: Heidelberg Dordrecht.

Operations Research

Objectives:

Management Science, an approach to decision making based on scientific method, makes extensive use of quantitative analysis. The purpose of this course is to provide students with a sound conceptual understanding of the role that management science plays in the decision-making process.

Unit 1

Operations Research: An Introduction

Operations Research – A quantitative approach to decision-making, the history of Operations Research, definitions of Operations Research, features of Operations Research approach, Operations Research approach to problem solving, advantages of Model Building, Methodology of Operations Research, advantages of Operations Research study, opportunities and shortcomings of the Operations Research approach, applications of Operations Research

Unit 2

Linear Programming: Applications and Model Formulation

Structure of Linear Programming model, advantages of using Linear Programming, limitations of Linear Programming, application areas of Linear Programming, general mathematical model of Linear Programming problem, guidelines on Linear Programming model formulation, examples of LP Model formulation.

Unit 3

Linear Programming: The Graphical Method and the Simplex Method

Graphical solution methods of LP problems, Standard form of an LP problem, Simplex Algorithm - Maximisation case, Simplex Algorithm - Minimisation case: Two phase method, Big-M Method, Some complications and their resolution, Types of Linear Programming solutions.

Unit 4

Transportation Problem

Mathematical model of Transportation Problem, the Transportation Algorithm, Methods for finding initial solution, Test for Optimality, Variations in Transportation Problem, Maximization Transportation Problem, Tran-Shipment Problem.

Unit 5

Assignment Problem

Mathematical Models of Assignment Problem, solution methods of Assignment Problem: Hungarian Method for solving Assignment Problem, variations of the Assignment Problem, a typical Assignment Problem, Travelling Salesman problem.

Reference Books:

1. Sharma, J. K.(2013). Operations Reserach: Theory and Applications, 5th edition. Macmillan Publishers.

2. Sweeney, Dennis J., et al. (2008). *Introduction to Management Science.* Mason:Cengage Learning.

3. Vohra, N. D. (2006). *Quantitative Techniques in Management.* New Delhi: Tata McGraw Hill.

4. Srivastava, U. K, G. V. Shenoy and S. C. Sharma. (2005). *Quantitative Techniques for Managerial Decisions. New* Delhi: New Age International Ltd.

5. Wisniewski, Mik. (2009). *Quantitative Methods for Decision Makers*. London: Prentice-hall publications.

6. Gupta, M. P. and R. B. Khanna. (2009). *Quantitative Techniques for Decision Making*. New Delhi: PHI Learning Private Limited.

Introduction to R Programming

Objectives:

The objective of this course is to help you master the basics of R. In all these five units, you will cover its basic syntax that will make you ready to undertake your own first data analysis using R. Starting from variables and basic operations, you will learn how to handle data structures such as vectors, matrices, data frames and lists. We will further dive deeper into the graphical capabilities of R, and create your own stunning data visualizations. This course will also help you learn to build your own descriptive analysis and gain insight about the population through statistical inference.

Unit 1:

Exploring R

Installing R, Working with Script, Navigating the Workspace.

Reading and Writing Data sets in R: Using c() command to create data, using scan() command for getting data in R, reading bigger data files using read.csv, exporting data.

Unit 2:

Manipulation and Processing Data in R

Subsetting, adding calculated fields to data, combining and merging datasets in R, Sorting and Ordering data, Introduction to formula interface, putting data into shape with reshape2 package.

Unit 3:

Using Functions and Packages in R

Moving from script to functions, using arguments the smart way, scope of the function, dispatching to a method, using packages.

Unit 4

Descriptive statistics in R

Summary Commands, Name Commands, Summarizing Samples, Cumulative Statistics, Summary Statistics for Data Frames, Summary Statistics for Matrix Objects, Summary Statistics for Lists, Contingency Tables, Cross Tabulation; Analyzing Data Using Functions, Loops, and Data Frames: Matrices, Lists, and Data Frames, Indexing Vectors, Matrices, and Lists, Programming in R, RHadoop; Graphical Analysis in R:Plots for Single

Variable, Plots with Two Variables, Plots for Multiple Comparisons, Plots with Multiple Variables, Special Plots, Saving Graphs to External Files.

Unit 5

Hypothesis Testing in R

Introduction to Statistical Hypotheses, Using the Student's t-test, u-test, Paired t- and u-tests, Tests for Association, Goodness of Fit Tests.

Reference Books:

1. Crawley, Mitchael J.(2007). *The R Book.* Wiley.
2. Kerns, G. J. (2010). *An Introduction to Probability and Statistics using R.* Cran.
3. Lander, J. P. *R for Everyone.* Addison-Wesley Data and Analytics Series.
4. Gardener, Mark. *(2013).Beginning R: The Statistical Programming Language.* Wiley
5. Matloff, Norman. (2011). *The Art of R Programming - A Tour of Statistical Software Design..*
6. Grolemund, Garrett. (2014). *Hands-On Programming with R*. Shroff Publishers & Distributors.
7. Prajapati, Vignesh. (2014).*Big Data Analytics with R and Hadoop*. Shroff Publishers & Distributors

Semester III

Course Code	Name of Course	Lectures (L) Hours per week	Tutorial (T) Hours per week	Practical (P) Hours per week	Credits
MBABA301	Consumer Behavior and CRM	4			04
MBABA302	Data Mining - I	2	2	2	04
MBABA303	Multivariate Data Analysis	2	2	2	04
MBABA304	Time Series Econometrics	2	2	2	04
MBABA305	Data Visualization	2	2	2	04
MBABA306	Project - I		12		06
Total Credits					**26**

Consumer Behaviour and CRM

Objectives:

Objective of this course on Consumer Behaviour and Customer Loyalty is to present a comprehensive coverage of the subject with examples from the Indian Scenario. This course also challenges students to understand the complexities of consumer needs and perceptions and translate them into effective Marketing Strategies. The course will be focusing on real life case-studies from Indian environment.

Unit 1

Overview of Consumer Behaviour

Understanding Consumer Behaviour- Meaning and Concept of Consumer and Customer, Consumer Learning, Different Models in Consumer Behaviour, Consumer Decision making process-Concept of Consumer Decision; Levels of Consumer Decision Making; Consumer Decision Making Model, Changing Indian Consumer Behaviour-Drivers of Change; Changing Consumer Trends; Rural Consumer Behaviour; New Consumption Patterns, Organizational Buying Behaviour.

Unit 2

Factors Influencing Consumer Buying Decision

Influence of Culture on Consumer Behaviour-Concept of Culture; The measurement of Culture; Indian Core Values; Cultural aspects of emerging markets, Values, Lifestyles, and Psychographics- Impact of Values, Lifestyles and Psychographics on buying behaviour; Demographics, Lifestyles and Psychographics; Values and Value Systems, Group Influence on Consumption- Role of reference groups; Effect of reference groups on consumer decision making; Celebrity endorsements.

Unit 3

Customer Loyalty Comprehension

Meaning and definition of customer loyalty, Significance of Customer Loyalty, Customer Loyalty Ladder, Loyalty Principles, Benefits of Customer Loyalty, Customer Loyalty and its relationship with customer satisfaction, Customer retention and Brand Loyalty, Factors affecting customer loyalty formation, Rai Srivastava model of customer loyalty formation, Drivers of Customer Loyalty.

Unit 4

Customer Loyalty Outcomes

Characteristic Features of Behavioural Loyalty, Attitudinal Loyalty and Cognitive Loyalty, Role of Customer Loyalty outcomes in business decisions, Significance of Customer Loyalty for Marketers, Relationship Influencers of Customer Loyalty including factors mediating customer loyalty relationship with other relationship influencers, Customer Affinity, Customer Engagement.

Unit 5

Customer Loyalty Measurement and Application

Measuring Customer Loyalty, Customer Loyalty measurement models and scales, Influence of Service Quality on Customer Loyalty, Customer Loyalty in Retail Industry, Customer Loyalty in Banking and Insurance Industry, Customer Loyalty Application in Aviation Industry.

Reference Books:

1. Hawkins, Best, Coney: Consumer Behaviour Building Marketing Strategy, Tata McGraw Hill.

2. H.Peer Mohammed: Customer Relationship Management, Vikas.

3. Panwar, J.S. Beyond Consumer Marketing, Sage Response Books, New Delhi.

4. MukeshChaturvedi and AbhinavChaturvedi: Customer Relationship Management An Indian Perspective. Excel Books.

5. Deon – Buyer Behaviour, Oxford University Press.

Data Mining - I

Objectives:

At the end of this course, students will be able to communicate with their own data, find the variables that are most central to their observation, learn various modeling techniques including some very famous data mining techniques like CART, Random Forest, Market Basket Analysis, machine learning techniques like Graphical Model and Bayesian Network and be able to work with unstructured data.

Unit 1

Introduction to Data Mining

Data Mining for Business Intelligence, Data Mining Concepts and Definitions, How Data Mining Works, Data Exploration and Data Preparation

Unit 2

Predictive Modelling Using Regression

Basics of Linear Regression Analysis, Working with Linear Regression, Simple Linear Regression in R, Linear Model Results Objects, Model Building, Curvilinear Regression, Linear and non-linear regression, dummy variables, model selection and model validation

Unit 3

Classification& Association Rule Mining

Decision Tree, CART (Classification & Regression Tree), Random Forest, Market Basket Analysis and association rule mining

Unit 4

Cluster Analysis

Introduction to Clustering, Agglomerative Hierarchical Clustering, Clustering by Similarity Aggregation, Use of the R amap Package, K-Means Clustering, An Example of Clustering in R: European Protein Consumption, Example of Clustering in R: Monthly US Unemployment Rates

Unit 5

Graphical Models and Bayesian Network

Introduction to Graphical Models, Case Study—Application of a Graphical Model at Volkswagen, Introduction to Bayesian Statistics, Characteristics of Bayesian

Networks, Probabilistic Inference in Bayesian Networks, Bayesian Methods, Applications of Bayesian Networks.

Reference Books:

1. Turban, ShardaEfraim; Ramesh, DursunDelen and King, David. (2011). *Business Intelligence: A Managerial Approach*, 2nd Edition. Publisher: Prentice Hall.
2. Han, Jiawei and Kamber, Micheline. (2012). *Data Mining: Concepts and Techniques*, 3rd edition. Morgan Kaufman Publishers.
3. Tang, P.N., Steinback, M. and Kumar, V. (2006). *Introduction to Data Mining*. Addison Wesley.
4. Myatt, Glenn and Johnson, Wayne. (2009). *Making Sense of Data II.* John Wiley& Sons.
5. Rajaraman, Anand. (2011). *Mining of Massive Datasets.* New York: Cambridge University Press.

Multivariate Data Analysis

Objectives:

By the end of the subject, students should be able to understand the theory behind the statistics, Select the appropriate methods in function of the research question, Apply those methods to their data, Interpret and report the results from the analysis, Develop critical thinking of statistics.

Unit 1

Overview of Multivariate Statistics

What is Multivariate Analysis?, Multivariate Analysis in statistical terms, some basic concepts of Multivariate Analysis, a classification of Multivariate Techniques, types of Multivariate Techniques, Canonical Correlation, Guidelines for Multivariate Analyses and interpretation, a structured approach to Multivariate model building.

Unit 2

Data Cleaning and Multivariate Techniques

Graphical examination of the Data, missing data, outliers, testing the assumptions of Multivariate Analysis, incorporating Nonmetric data with dummy variables, a managerial overview of the results.

Unit 3

Factor Analysis and PCA

Introduction to Dimensionality Reduction, Applications of Dimensionality Reduction, Factor Analysis, Applications of Factor Analysis, Methods of Factor Analysis, Factor Analysis as a Data Reduction Method, Principal Component Analysis, Data Reduction and Interpretation in Principal Component Analysis, Implementation of Principal Component Analysis on R.

Unit 4

Multiple Regressions

What is Multiple regression analysis?, an example of simple and multiple regression analysis, a decision process for multiple regression analysis, Regression: Mediation & Moderation, a managerial overview.

Unit 5

Multiple Discriminant Analysis and Logistic Regression

What are Discriminant Analysis and Logistic Regression? MANOVA. Introduction to Generalized Linear Models, Logistic Regression, Line Estimation Using MLE, Transformation of a Nonlinear Model into a Linear Model, Other Nonlinear Regression Models, Generalized Additive Models, Bootstrapping a Family of Nonlinear Regressions, Applications of Logistic Regression.

Reference Books:

1. Hair, J. F. et al. (2006). *Multivariate Data Analysis*, 6th edition. NJ: Prentice Hall.

2. Aiken, L. S., & West, S. G. (1991). *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage.

3. Menard, S. (2002). *Applied Logistic Regression Analysis*. Thousand Oaks, CA: Sage.

4. Tabachnick, B. and Fidell, L (2007). *Using Multivariate Statistics*, 5th edition. New York: Allyn& Bacon.

5. Cohen, J., & Cohen, P. (1983). *Applied Multiple Regression/Correlation Analysis for the Behavioural Sciences*, 2nd edition. Hillsdale, N.J.: Erlbaum.

6. Stevens, J. (1992). *Applied Multivariate Statistics for the Social Sciences*, 2nd edition. Hillsdale, N.J.: L. Erlbaum Associates.

Time Series Econometrics

Objectives:

By the end of the subject, students should be able to:

- Familiarize with Univariate and multivariate models of stationary and nonstationary time series in the time domain.
- Develop a comprehensive set of tools and techniques for analyzing various forms of univariate and multivariate time series, and for understanding the current literature in applied time series econometrics.
- Survey some of the current research topics in time series econometrics.

Unit 1

Introduction to Time Series

What is Time Series Analysis - Data associated with time series, Difference between time series Econometrics and Economic Econometrics? Components of time series Trend, Seasonal, Cyclical and Irregular Variations, introduction to time series decomposition models- Additive model, multiplicative model and mixed model.

Unit 2

Elementary time series forecasting methods and its Evaluation

Quantitative method of forecasting methods- Free hand method, Naïve forecasting , Moving Averaging method, Weighted moving average method, Smoothing method- Exponential Smoothing, Double Exponential Smoothing, Forecasting through Averaging and Exponential Smoothing; Holt's-Winter Exponential smoothing model. Solution for the time series involves trend, seasonal, cyclical and irregular components. Forecasting evaluation techniques through MAD (Mean Absolute Deviation), MSE (Mean Square Error) and Mean Absolute Percent Error.

Unit 3

Introduction to Time Series Econometrics

Time series Econometrics Basic concepts – Strict Stationary , Weak Stationary (Stochastic Process), white noise process, Random Walk –with Draft, without Draft, Auto covariance, Auto

Correlation, Auto Regression, Moving Average, concepts related to lagged values & its operators, differencing operators and spurious regression.

Unit 4

Univariate Time Series Models

Tests for stationarity- Graphical Method, Unit Root Test (Augmented Dickey Fuller Test, Phillips–Perron test, Schmidt –Phillips Tests, KPSS Test). Identification of ARMA models& parameter estimation nd testing its significance with forecasting, Stationary restriction for ARMA models, Introduction to ARIMA models- Model parameter estimation, testing parameter significance and forecasting.

Unit 5

Advanced topics in time series econometrics

Introduction to Multivariate Time series Econometrics, Co integration, Vector Auto Regressive Models, VECM (Vector Error Correction model) and its estimation with testing. Estimation of Unrestricted VAR. Granger causality, Estimation ARCH (Auto Regressive Conditional Heteroscedasticity) and GARCH (Generalized Auto Regressive Conditional Heteroscedasticity).

Reference Books:

1. Hamilton, J. D. (1994). Time Series Analysis. Princeton University Press.
2. Enders, W. (2010). *Applied Econometric Time Series*. Hoboken, NJ: John Wiley & Sons.
3. Zivot, Eric and Jiahui (Jeffery). (2002). Modeling Financial Time Series with S-PLUS. Wang: Springer-Verlag.
4. Brooks, Chris. (2008). *Introductory Econometrics for Finance.* Cambridge University Press.

Data Visualization

Objectives:

By the end of the subject, students should be able to construct their own data visualization using Tableau and R, differentiate between exploration and visualization, understand various visual encodings, develop techniques for visualizing time, visualize statistical models and build models using visualization.

Unit 1

An Introduction to Data Visualization, Data Types and Visual Encodings, Visualizing Time, Strategies for illustrating trends and results. Sample data visualization exercise.

Unit 2

Design fundamentals for data visualization. Tufte's Design Rules. Presentation and discussion.

Unit 3

Thinking like a statistical modeller. Predictive modelling using visualization, visualization Model, Heat maps, Mosaic plot, Trees and clustering.

Unit 4

Data Visualization using Tableau. Tableau Products: Creating Visualization with Tableau Desktop, Introduction to the Tableau Desktop Workspace, Multiple Worksheet Page, Tableau Workspace; Working with Data Sources: Joining Database Tables with Tableau, Connecting to SQL; Operation on Data (Sorting, Aggregating, Joins): Maps and Geographic Units, Creating Interactive Visualizations

Unit 5

Big Data Business Problems and Solutions—Use of Visualization Tools in E-Commerce: Application of Big Data for e-Commerce Companies, Scenario, Explanation of Data

Reference Books:

1. Few, Stephen. (2009). N*ow You See It: Simple Visualization Techniques for Quantitative Analysis*. Analytic Press.

2. Dalgaard, Peter. (2008). *Introductory Statistics with R*, 2nd Edition. California: Springer.

3. Chen, Chun-houh; Hardle, Wolfgand; Unwin, Antony. (2008). *Handbook of Data Visualization*. Springer.

Semester IV

Course Code	Name of Course	Lectures (L) Hours per week	Tutorial (T) Hours per week	Practical (P) Hours per week	Credits
MBABA401	Strategic Management	2	2	2	04
MBABA402	Data Mining - II	2	2	2	04
MBABA403	Big Data Analytics	2	2	2	04
MBABA404	Predictive Modeling using SAS	2	2	2	04
MBABA405	Advanced Analytics	2	2	2	04
MBABA406	Project - II		12		06
Total Credits					**26**

Strategic Management

Learning Objectives:
To expose the students to elements of business strategy - the science & art behind this and learning from the masters of sound & creative strategic thinking and to expose the students to the fundamentals of long term & strategic thinking; to explore the various scenarios that could emerge & evaluate their respective advantages & drawbacks; scanning & identifying opportunities; strategy formulations as well as implementation.

Unit 1: Introduction to Strategic Management
Introduction to Strategic Management, Challenges to Strategic Management – The Indian Scenario, Introduction to Business Policy, Strategic Management Process, Levels of Strategy, the Concept of Strategy, Strategic Intent, Vision, Mission, Goals and Objectives, Business Definition.

Unit 2: Strategy Framework
Environmental Appraisal, Characteristics of Environment, Internal versus External Environment, Environmental Scanning, Environmental Appraisal, Factors Affecting Environment Appraisal, Structuring Environment Appraisal, Identifying the Environmental Factors, Tools and Techniques for Strategic Analysis, SWOT Analysis, Porter's Five Force Model, TOWS Matrix, The General Electric Model, BCG Analysis.

Unit 3: Strategy Formulation
Strategy Formulation, Corporate-Level Strategies, Strategic Alternatives and Reasons for Adopting Them, Concentration Strategies, Integration Strategies, Diversification Strategies, Business-Level Strategies, Factors that Determine Choice of Competitive Strategy, Generic Business Strategies, Cost Leadership, Differentiation, Focus, Functional Strategies, Concept of

Core Competencies, Production Strategy, Research and Development Strategy, Human Resource Strategy.

Unit 4: International Strategy

Strategies in the Global Environment, International Strategies, Types of International Strategies, Strategic Decisions in Internationalization, Advantages and Disadvantages of Internationalization, Cooperative Strategies, Joint Venture Strategies, Strategic Alliances.

Unit 5: Business Policy and Strategy for International Business

Strategy Implementation, Evaluation and Control, Strategy Implementation, Structure and Strategy, Interaction between Structure and Strategy – A Case Study, Types of Organisational Structures, Stages of Development of Organisation, Structures for Strategies, Strategy and Leadership, Organisational Values and Strategy, Resource Allocation – A Vital Part of Strategy, Strategic Evaluation and Control, Strategic Evaluation, Strategic Control, Operational Control, Process of Operational Evaluation, Evaluation Techniques for Operational Control, Strategic Control Versus Operational Control. Case studies.

Reference Books:
1. Porter, Micheal. (1998). *Competitive Strategy*. Free Press.
2. Mukherjee, Ravikant, (2010). *Business Policy and Strategic Management*. Adhyayan Publishers.
3. Roy, Aurnob. (2008). *Business Policy & Strategic Management (Text &Cases)*. Vrinda Publications.
4. Varughese, Roy. (1997). *Strategic Enterprise Management*. Intl Thomson Computer Press.
5. Wheelen, T. L. and Hunger, J. D. (2010). *Concepts In Strategic Management And Business Policy*. Pearson Publication.
6. Ramo, Simon and Sugar, Ronald. (2009). *Strategic Business Forecasting: A Structured Approach to Shaping the Future of Your Business*. Mcgraw-hill.
7. Wheelen, Thomas L. (2009). *Outlines & Highlights for Strategic Management & Business Policy: Achieving Sustainability*. Academic Internet Publishers.

Data Mining- II

Objectives:

At the end of this Subject, students will:

- Explain what the goals and objectives of data mining are and how to conduct a data mining project.

- Have sound knowledge of popular classification techniques, such as decision trees, support vector machines and nearest-neighbor approaches.

- Familiarise with Machine learning models.

Unit 1

Data Exploration, Data Transformation and Data Processing

Unit 2

Understanding Machine Learning Technology: What Is Machine Learning?, Applications of Machine Learning, Types of Machine Learning, Machine Learning Approaches, List of Machine Learning Algorithms.

Unit 3

Decision Trees: Applications of Decision Trees, Principle of Decision Trees, Building Decision Trees, CART, C5.0, and CHAID Trees, Prediction by Decision Tree, Advantages and Disadvantages of Decision Trees, Building Decision Trees in R

Unit 4

Artificial Neural Networks: Introduction to Neural Networks, Applications of Neural Networks, Structure of a Neural Network, Models of Artificial Neural Networks, Learning Rules, Algorithms for Training Neural Networks, Implementation of Neural Networks in R.

Unit 5

Support Vector Machines: Introduction to Support Vector Machine, Application Areas of Support Vector Machines, SVM Algorithms, Linear Support Vector Machine, Kernel Function, Training *and Testing SVM Models in R, A Practical Example of Prediction using SVM Model.*

Reference Books:

1. Turban, Sharda Efraim; Ramesh, Dursun Delen and King, David. (2011). *Business Intelligence: A Managerial Approach*, 2nd Edition. Publisher: Prentice Hall.

2. Han, Jiawei and Kamber, Micheline. (2012). *Data Mining: Concepts and Techniques* (3rded.). Morgan Kaufman Publishers.

3. Tang, P.N., Steinback, M. and Kumar, V. (2006). *Introduction to Data Mining*. Addison Wesley.

4. Myatt, Glenn and Johnson, Wayne. (2009). *Making Sense of Data II.* John Wiley& Sons.

5. Rajaraman, Anand. (2011). *Mining of Massive Datasets.* New York: Cambridge University Press.

Big Data Analytics

Objectives:

By the end of the course, the student will be able to:

- Deploy a structured lifecycle approach to data science and big data analytics projects.
- Select techniques and tools to analyze big data and create statistical models.

Unit 1
Introduction to Big Data

So What Is Big Data?, History of Data Management—Evolution of Big Data, Structuring of Big Data, Elements of Big Data, Application of Big Data in the Business Context, Careers in Big Data.

Business Applications of Big Data: The Significance of Social Network Data, Financial Fraud and Big Data, Fraud Detection in Insurance, Use of Big Data in the Retail Industry.

Unit 2
Technologies for Handling Big Data

Distributed and Parallel Computing for Big Data, Introducing Hadoop, Cloud Computing and Big Data, In-Memory Technology for Big Data.

Unit 3
Understanding the Hadoop Ecosystem

The Hadoop Ecosystem, Storing Data with HDFS, Processing Data with Hadoop Map Reduce, Storing Big Data with HBase, Using Hive for Querying Big Databases, Interacting with Hadoop Ecosystem.

Unit 4
Map Reduce Fundamentals

Origins of MapReduce, How MapReduce Works, Optimization Techniques for MapReduce Jobs, Applications of MapReduce, Role of HBase in Processing Big Data, Mining Big Data with Hive

Unit 5

Integrating R and Hadoop and Understanding Hive

Hadoop, Integrating R and Hadoop—RHadoop, Text Mining for Deriving Useful Information, Introduction to Hive

Reference Books:

1. Tan, Pang-Ning, Steinbach, Michael and Kumar, Vipin. (2005). *Introduction to Data Mining*. Addison-Wesley.
2. Lin, Jimmy and Dyer, Chris. (2010). *Data-Intensive Text Processing with MapReduce.* Morgan & Claypool Publishers.
3. Rajaraman, Anand and Ullman, Jeff. (2008). *Mining of Massive Datasets*. New York: Cambridge Press.
4. Han, Jiawei and Kamber, Micheline. (2000). *Data Mining: Concepts and Techniques*. The Morgan Kaufmann Series in Data Management Systems, Jim Gray, Series Editor Morgan Kaufmann Publishers.

Predictive Modeling using SAS

Objectives:

By the end of the subject, students should be able to:

- familiarise with the concepts of a SAS Enterprise Miner project and explore data graphically.
- modify data for better analysis results.
- build and understand predictive models such as decision trees and regression models.
- compare and explain complex models.
- generate and use score code.
- apply association and sequence discovery to transaction data.
- use other modeling tools such as rule induction, gradient boosting and support vector machines.

Unit 1

Introduction

Introduction to SAS Enterprise Miner, Accessing and Assaying Prepared Data: Creating a SAS Enterprise Miner project, library and diagram, defining a data source, exploring a data source.

Unit 2

Introduction to Predictive Modeling with Decision Trees

Cultivating decision trees, optimizing the complexity of decision trees, Understanding additional diagnostic tools.

Unit 3

Introduction to Predictive Modeling with Neural Networks and Other Modeling Tools

Introduction to neural network models, Input selection, Stopped training, Other modeling tools.

Unit 4

Model Assessment

Model fit statistics, Statistical graphics, adjusting for separate sampling, Profit matrices, Model Implementation: Internally scored dataset, Score code modules.

Introduction to Pattern Discovery: Cluster analysis, Market basket analysis.

Unit 5

Special Topics

Ensemble models, Variable selection, Categorical input consolidation, Surrogate models.

Advanced Analytics

Objectives:

By the end of the subject, students should be able to:

- gain an understanding of how managers use business analytics to formulate and solve business problems and to support managerial decision making.
- become familiar with the processes needed to develop, report, and analyze business data.
- Work with various real world business problems.
- Understanding the concept of fraud, credit risk, customer segmentation, text mining, mobile analytics and survival analytics.

Unit 1
Social Media Analytics and Text Mining
What Is Social Media?, Social Analytics, Metrics, and Measurement, Key Elements of Social Media Analytics, Introduction to Text Mining, Text Analysis Process, Sentiment Analysis, Implementation of Twitter Sentiment Analysis on R.

Unit 2
Performing Mobile Analytics
Introducing Mobile Analytics, Mobile Analytics Tools, Performing Mobile Analytics, App Analytics Reports, Challenges of Mobile Analytics.

Unit 3
Insurance Fraud Analytics and Credit Risk
Insurance Fraud Analytics: Insurance Contract, Types of Policies; Insurance Fraud and its Implications: Data Analytics for Predicting Fraud. Credit Risk: Computing Credit Scores

Unit 4
Customer Segmentation
Telecom Industry: Customer Churn, Lack of Optimal Marketing Strategies, Need for Call Data Record (CDR) Analysis; Use of Data Analytics for Increasing Profitability: Preventing Customer Churn, Implementing Optimal Marketing Strategies, Analyzing

Call Detail Records. Online Customer Segmentation:Using Data Analytics for Customer Segmentation.

Unit 5

Survival Analysis

Time to event data, Censoring and truncation, Hazard and survival functions, Kaplan-Meier estimate of survival functions, Cox proportional hazard model, application of survival analysis in health industry and business.

Reference Books:

1. Isson, Jean-Paul and Harriott, Jesse. (2012). *Win with Advanced Business Analytics: Creating Business Value from Your Data*, 1st edition. New York: Wiley.
2. Shmueli, Galit, Patel, Nitin and Bruce, Peter. (2010). *Data Mining for Business Intelligence*. New York: Wiley.
3. Hand, David, Mannila, Heikki and Smyth, Padhraic. (2001). *Principles of Data Mining*. MIT.
4. Han, Jiawei and Kamber, Micheline. (2012). *Data Mining: Concepts and Techniques*, 3rd edition. Morgan Kaufman Publishers.
5. Myatt, Glenn and Johnson, Wayne. (2009). *Making Sense of Data II.* New York: John Wiley& Sons.
6. Rajaraman, Anand. (2011). *Mining of Massive Datasets.* New York: Cambridge University Press.