BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
Pilani Campus
AUGS/ AGSR Division

SECOND SEMESTER 2020-21
COURSE HANDOUT

Date: 16 Jan 2021

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : MBA G561

Course Title : Business Analytics

Instructor-in-charge : Nirankush Dutta

Instructor : Nirankush Dutta & Udayan Chanda

1. Scope and Objective of the Course:

Business analytics refers to the ways in which enterprises such as businesses, non-profits, and governments can use data to gain insights and make better decisions. Business analytics is applied in operations, marketing, finance, and strategic planning among other functions. The course emphasizes that business analytics is not a theoretical discipline: these techniques are only interesting and important to the extent that they can be used to provide real insights and improve the speed, reliability, and quality of decisions. The concepts learned in this course should help to identify opportunities in which business analytics can be used to improve performance and support important decisions. It should make a manager alert to the ways that analytics can be used — and misused — within an organization.

In this course, students will learn to identify, evaluate, and capture business analytic opportunities that create value. Toward this end, students will learn basic analytic methods and analyze case studies on organizations that successfully deployed these techniques. In the first part of the course, we focus on how to use data to develop insights and predictive capabilities using machine learning, data mining and forecasting techniques. In the second part, we focus on the use of optimization to support decision-making in the presence of a large number of alternatives and business constraints. Finally, throughout the course, we explore the challenges that can arise in implementing analytical approaches within an organization.

We have three goals in this course. The first is to help you think critically about data and the analyses based on those data — whether conducted by you or someone else. The second is to enable you to identify opportunities for creating value using business analytics. The third is to help you estimate the value created using business analytics to address an opportunity.

Business analytics is an integral part of modern management — this course should provide you with the foundation you need to understand and apply these methods to drive value.

2. Text Book:

Camm, J., Cochran, J., Fry, M., Ohlmann, J., & Anderson, D. (2014). Essentials of Business Analytics South-Western College Publishing; International edition.

Reference Books:

R1 Albright, S., & Winston, W. (2014). Business analytics: Data analysis & decision making. Nelson Education..

R2 Jank, W. (2011). Business analytics for managers. Springer Science & Business Media.

R3 Parr-Rud, O. (2014). Business Analytics Using SAS Enterprise Guide and SAS Enterprise Miner: A Beginner's Guide. SAS Institute.

R4 Camm, J., Cochran, J., Fry, M., Ohlmann, J., & Anderson, D. (2014). Essentials of Business Analytics. Nelson Education.

3. Course Plan:

Learning Objectives	Topics to be Covered	Lecture Nos.	Ref. To Text book
Introduction to Business Analytics	Decision Making, Business Analytics Defined, A Categorization of Analytical Methods and Models, Big Data, Business Analytics in Practice	1-2	Chapter1+ class notes
Descriptive Statistics	Overview of Using Data: Definitions and Goals, Types of Data, Modifying Data in Excel, Creating Distributions from Data, Measures of Location, Measures of Variability, Analyzing Distributions, Measures of Association Between Two Variables, Data Cleansing, Case Problem	3-4	Chapter2+ class notes+ Cases
Data Visualization	Overview of Data Visualization, Tables, Charts, Advanced Data Visualization, Data Dashboards, Case Problem	5	Chapter3+ class notes+ Cases
Descriptive Data Mining	Cluster Analysis, Association Rules, Text Mining, Case Problem	6-12	Chapter4+ class notes+ Cases

Probability & Statistical Inference	Discrete Probability Distributions, Continuous Probability Distributions, Selecting a Sample, Point Estimation, Sampling Distributions, Interval Estimation, Hypothesis Tests, Big Data, Statistical Inference, and Practical Significance, Case Problem	13-15	Chapter5 & 6+ class notes+ Cases
Predictive Data Mining	Data Sampling, Preparation, and Partitioning, Performance Measures, Logistic Regression, k-Nearest Neighbors, Classification and Regression Trees, Case Problem	16-24	Chapter9+ class notes+ Research papers
Spreadsheet Models	Building Good Spreadsheet Models, What-If Analysis, Some Useful Excel Functions for Modeling, Auditing Spreadsheet Models, Predictive and Prescriptive Spreadsheet Models, Case Problem	25-29	Chapter10 + class notes+ Cases
Monte Carlo Simulation	Risk Analysis, Simulation Modeling, Simulation with Dependent Random Variables, Simulation Considerations, Verification and Validation, Advantages and Disadvantages of Using Simulation, Case Problem	30-34	Chapter11 + class notes+ Cases
Linear Optimization Models	A Simple Maximization Problem, A Simple Minimization Problem, Special Cases of Linear Program Outcomes, Sensitivity Analysis, General Linear Programming Notation and More Examples, Generating an Alternative Optimal Solution for a Linear Program, Case Problem	35-36	Chapter12 +class notes+ Cases
Integer Linear Optimization Models	Types of Integer Linear Optimization Models, Solving Integer Optimization Problems with Excel Solver, Applications Involving Binary Variables: Capital Budgeting, Fixed Cost 618 Bank Location, Product Design and Market Share Optimization, Modeling Flexibility Provided by Binary Variables, Generating Alternatives in Binary Optimization, Case Problem	37-38	Chapter13 +class notes+ Cases
Optimization Models	An Unconstrained Problem, A Constrained Problem, Solving Nonlinear Optimization Models Using Excel Solver, Sensitivity Analysis and Shadow Prices in Nonlinear Models, Local and Global Optima, Overcoming Local Optima with Excel Solver, A Location Problem, Markowitz Portfolio Model, Forecasting Adoption of a New Product, Case Problem	39-40	Chapter14 +class notes+ Cases

4. Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Remarks
Mid Semester	90 minutes	30		OB
Test/Assignment/Project		20	To be announced in class	OB
Quiz		10		CB
Comprehensive	180 minutes	40		CB

5. Chamber Consultation Hours:

Wednesday 12:00 PM to 1:00 PM (except holidays). For emergency, students may send a mail to the concerned faculty member for scheduling an appointment at a convenient time.

6. Notice:

Notices concerning this course will be announced through Google Classroom.

7. Make-up Policy:

If the student is unable to appear for the Regular Test/ Examination due to genuine exigencies, the student must refer to the procedure for applying for Make-up Test/ Examination. The instructor must be informed prior to the evaluation component. Make-up for Quizzes, Assignment, Case Studies and Projects will not be granted.

10. Note:

1. It will be the responsibility of the individual student to be regular in maintaining self-study schedule as given in the course handout, attend lectures, submit assignments for evaluation and present any assignment, as per the schedule announced.

2. All deadlines, as mentioned in the class, have to be strictly adhered to. Failure to do so will result in deduction of partial / full marks for that submission.