

## 22BA105: BUSINESS ANALYTICS FOR MANAGERIAL DECISION MAKING

Course Code	22BA105	Course Delivery Method	Class Room / Blended Mode
Credits	04	CIA Marks	30
No. of Lecture Hours / Week	05	Semester End Exam Marks	70
Total Number of Lecture Hours	75	Total Marks	100
Year of Introduction :1987	Year of Offering :1987	Year of Revision :--	Percentage of Revision :--

### Course Description and Purpose:

The role of business analytics in assisting decision-making has now become essential for all organizations in today's data-driven world where data and the insights that it can inspire are a source of competitive advantage. While business analytics is now being used at various levels within the organization. This course gives an introduction to the area of business analytics. Business Analytics (BA) is generally understood as the extensive use of data, mathematical and statistical models using exploratory, descriptive, predictive and causal models under the framework of evidence and fact-based management to drive decisions and actions.

### Course Outcomes:

By the end of the course, students will be able:

- CO-1 To gain an understanding of how managers use business analytics to formulate and solve business problems and to support managerial decision making.
- CO-2 To provide students with knowledge of mathematical models for quantitative analysis of managerial problems in Industry and to improve skills in the use of descriptive statistics for business decisions.
- CO-3 To enable the students understanding probability concepts, probability distributions and its applications in business.
- CO-4 To develop the ability to evaluate the predictive analytics models like correlation, Regression and Time Series analysis.
- CO-5 To understand the significance of Business analytics in managerial decision-making

## Course Content

### UNIT-I

**Introduction:** Meaning, Definition and Importance of Business Analytics – Analytics v/s Analysis – Business Analytics v/s Business Intelligence and Data Mining – Applications of Analytics – Different Kinds of Analytics – Types of Analytical Tools – Identifying Problems & Opportunities through Data Analytics – Framing a Business Problem as an Analytical Problem – Analytical Approaches for Decision Making (**Theory**) **(15 Hours)**

### UNIT-II

**Mathematics and Statistics for Business Analytics:** Application of Differentiation, Maxima and Minima, Matrices and Matrix Operations using Cramer's Rule and Inverse Method (Problems) – Statistics for Business Analytics: Diagrammatic and Graphical Representation of the data Measures of Central Tendency, Measures of Dispersion, Skewness (**Theory and Problems**). **(15 Hours)**

### UNIT-III

**Probability and Probability distributions:** Concept of Probability, Definitions of Probability, Addition Theorem of Probability, Conditional Probability and Multiplication theorems of Probability, Baye's Theorem of Probability and its Applications. Theoretical distributions: Binomial Distribution, Poisson distribution and Normal distribution – their Properties and Applications (**Theory and Problems**). **(15 Hours)**

### UNIT-IV

**Predictive Analytics:** Correlation, Regression and Time Series: Correlation: Types of Correlation - Simple and Rank Correlation coefficient in the case of two variables- Regression: Meaning and importance of Regression Analysis. Estimation of Lines of Regression in the case of two variables Time Series – Components of Time Series – Measurement of Trend (Linear Equation) (**Theory and Problems**). **(15 Hours)**

### UNIT-V

**Business Analytics for Decision making:** – Introduction to Hypothesis – Procedure for Testing of Hypothesis – Large and Small Sampling Tests – Z-Test, Single Proportion – Two Proportions – Single Mean – Two Means – t-Test – Single Mean – Difference of Means – Paired t- test – Chi-square test – Goodness of Fit – Independence of Attributes (**Problems**). **(15 Hours)**

### PRACTICAL COMPONENTS:

- ✓ Students should identify any three companies using data analytics, and analyze how companies are using analytics to prosper.
- ✓ Should form groups (A group consists of 4-6 students) and download R the most popular software (free and open source)

- fordatamanagement andstatistical analysisof data.
- ✓ Studentsshouldconductateambasedproject,whichisaunifiedandpracticalcaseon a topicof their choice, with approximately4-6 students pergroup.
  - ✓ Assess the strengths and limitations of analytics and predictive modeling techniques fordifferent business applications and varying data conditions using free and open sourcesoftware'slike'R'.
  - ✓ Students are asked to conduct Market survey to know the consumer perception towardsanyFMCG.

**REFERENCETEXTBOOKS:**

1. S.C. Gupta.-, Fundamentals of Statistics, 7th Revised Edition (2013) Himalaya Publishing House, New Delhi.
2. Sharma, J.K.-, Fundamentals of Business Statistics, 2nd Edition (2000) Pearson Education, New Delhi.
3. Sancheti, Dc & V.K Kapoor, Business Mathematics, 3<sup>rd</sup> Edition (2014) Sultan Chand & Sons, New Delhi..
4. Sharma, J.K., Quantitative Methods- Theory & Applications, 3<sup>rd</sup> Edition (2010)Macmillan New Delhi.
5. Shmueli,PatelandBruce,*DataMiningforBusinessIntelligence,Concepts,TechniquesandApplications*,Wiley.
6. PowellandBaker,*ManagementScience:The ArtofModelingwithSpreadsheets*,Wiley.
7. Ledolter,*DataMiningandBusinessAnalyticswithR*, Wiley.

**MODEL QUESTION PAPER**  
**PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS & SCIENCE**  
**M.B.A. (REGULAR) DEGREE EXAMINATION**  
**First Semester**  
**20BA105: BUSINESSANALYTICSFORMANAGERIALDECISIONMAKING**  
**W.e.f 2022-2023**

**Duration:** 3 hours

**Maximum Marks:** 70

**SECTION - A**

**Answer ALL Questions**

**5×4=20 Marks**

1. (A) plain the Importance of Business Analytics. (CO1)(L2)

**(OR)**

- (B) describe the Data Mining. (CO1)(L2)

2. (A) What are the Measures of Central Tenancy. (CO2)(L2)

**(OR)**

- (B) Explain Co-efficient of skewness. (CO2)(L2)

3. (A) State Addition theorem of probability. (CO3)(L1)

**(OR)**

- (B) Define Binomial Distribution. (CO3) (L1)

4. (A) Illustrate Scatter Diagram Method. (CO4)(L3)

**(OR)**

- (B) Uses of Time Series Analysis. (CO4)(L3)

5. (A) Explain Procedure for testing of hypothesis. (CO5) (L2)

**(OR)**

b) Distinguish between large and small sample tests with examples. (CO5) (L2)

### SECTION- B

*Answer All Questions*

**5×8=40 Marks**

6. a) Discuss the types of analytical tools available in the market to serve the needs of the organization. (CO1) (L2)

(OR)

b) Explain the applications of analytics. Framing a business problem as an analytical problem. (CO1)(L2)

7.a) Solve the following system of equations by matrix method (CO2) (L3)

$$2x - 3y - 5z = 11$$

$$3x + 2y - 4z = -5$$

$$x + y - 2z = -3$$

(OR)

b) Calculate the coefficient of variation from the following: (CO2) (L3)

Age (in years) :	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69
Frequency .	360	700	903	503	270	1200

8. a) What is Normal Distribution? Explain characteristics and importance of the normal distribution (CO3)(L2)

(OR)

b) The contents of urns I, II and III are as follows:

1 white, 2 black and 3 red balls,

2 white, 1 black and 1 red balls, and

4 white, 5 black and 3 red balls

One urn is chosen at random and two balls drawn. They happen to be white and red. What is the probability that they came from urns I, II or III? (CO3)

(L2)

9.a) : a straight-line trend for the following series. Estimate the value for 2018.

(CO4)(L3)

Year	2011	2012	2013	2014	2015	2016	2017
Production of steel (in tonnes)	60	72	75	65	80	85	95

OR

- b) Two regression equations between x and y are :  $10x - 20y - 14 = 0$  and  $5x - 6y = 47$

The standard deviation of x is 9. Find i) the mean values of x and y; ii) the variance of y; and iii) the coefficient of correlation between x and y. (CO4)(L3)

10. a) The sales data of an item in six shops before and after a special promotional campaign are as under (CO5)(L4)

Shop	A	B	C	D	E	F
Before campaign	48	23	26	43	45	37
After campaign	53	24	25	50	51	40

Is the campaign judged to be a success?

OR

- b) Two types of batteries are tested for their length of life and the following data are obtained: (CO5) (L4)

	No. of Samples	Mean life in Hours	Variance
Type A:		0	1
Type B:		0	4

Is there a significance difference in the two means? (Table value=2.131)

### SECTION C - (1 x 10 =10 marks)

#### Case study (Compulsory)

11. A Movie producer is bringing out a new movie. In order to map out his advertising he wants to determine whether the movie will appeal most to a particular age group or

whether it will appeal equally to all age groups. The producer takes a random sample from persons attending a pre-reviewing showing of the new movie and obtains the following result. Use  $\chi^2$ -test to derive the conclusion.(CO4) (L4)

AGE GROUPS

Persons	Under- 20	20-39	40-59	60 and ever	Total
Like the movie	320	80	110	200	710
Disliked the movie	50	15	70	60	195
Indifferent	30	5	20	40	95
Total	400	100	200	300	1000

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