Gyanmanjari Innovative University

Subject: Quantitative Techniques - BBAXX12308

Type of course: Multidisciplinary

Prerequisite: Students should have a solid foundation in arithmetic and basic statistical measures. Students should be familiar with data types, measures of central tendency and dispersion, probability concepts, including probability distributions, and statistical inference methods. Additionally, a basic understanding of hypothesis testing and linear regression, both simple and multiple, is required.

Rationale: This syllabus empowers students with vital business decision-making skills, spanning quantitative techniques, data analysis, and key statistical concepts. It culminates in a comprehensive study of probability, distributions, and linear regression, offering practical tools for quantitative application in business.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks			Total Marks
					CCE		
CI	T	P	C	SEE	MSE	ALA	
4	0	0	4	100	30	70	200

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; SEE – Semester End Evaluation; MSE- Mid Semester Examination; V – Viva; CCE-Continuous and Comprehensive Evaluation; ALA- Active Learning Activities.

4 Credits * 25 Marks = 100 Marks (each credit carries 25 Marks)
SEE 100 Marks will be converted into 50 Marks
CCE 100 Marks will be converted into 50 Marks
It is compulsory to pass in each individual component

Course Content:

Sr. No	Course content	Hrs.	% Weightage
1	**Introduction to Quantitative Techniques:** • Role of Quantitative Techniques in Business: Definitions, scope, Importance • Data and Data Presentation: Types of data (qualitative and quantitative), Data collection methods, Data presentation (tables, charts, graphs) • Measures of Central Tendency: Mean, median, mode • Measures of Dispersion: Range, variance, standard deviation	20	35
2	**Probability and Probability Distributions:** • Basics of Probability: Definitions and concepts, Probability rules (addition and multiplication rules) • Probability Distributions: Discrete and continuous distributions • Probability mass functions and probability density functions • Binomial Probability Distribution • Normal Distribution	20	35
3	**Statistical Inference:** • Sampling and Sampling Distributions: Types of sampling (random, stratified, etc.), Central Limit Theorem • Hypothesis Testing: Null and alternative hypotheses, Steps in hypothesis testing	10	15
4	**Linear Regression:** • Simple Linear Regression: Scatter plots and correlation, Regression equation and interpretation • Multiple Linear Regression: Extension to multiple independent variables, Model interpretation and prediction	10	15

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	**Software Discovery Challenge:** In groups of five, students identify and research statistical software used in different fields, compile details in a Word file, and upload a group PDF on the GMIU web portal, with each student focusing on one software.	10
2	**Assignment:** Faculty will assign the task regarding the calculative portion of the syllabus. Students have to submit the same on the GMIU web portal.	10
3	**Measures of Central Tendency Exploration:** Students will conduct a small survey among family or friends to collect quantitative data. Calculate the mean and median of the quantitative data and submit that report on the GMIU web portal.	10
4	**Probability in Everyday Life:** Students have to explore daily situations involving probability (e.g., rain, game outcomes). Submit findings to connect theoretical concepts with real-life scenarios which they have to submit on the GMIU web portal.	10
5	**Data Presentation Report:** Students will find a publicly available dataset or create a small dataset. Use free online tools like Google Sheets or Excel to create various data visualizations, including tables, charts, and graphs which reports submit on the GMIU web portal.	10
6	**Linear Regression Problem Solving:** Faculty will present the Linear regression problem, Students have to solve it by themselves, and it should include the formulation of the problem, the application of the method, and the interpretation of the results and file upload on the GMIU web portal.	10
7	**Attendance**	10
	Total	70

Suggested Specification table with Marks (Theory):100

Distribution of Theory Marks (Revised Bloom's Taxonomy)					
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	10%	30%	50%	10%	-	-

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course, the students should be able to:	
CO1	Analyze the role and significance of quantitative techniques in business decision-making.
CO2	Differentiate between qualitative and quantitative data, analyze data collection methods, and master effective presentation techniques.
CO3	Understand central tendency (mean, median, mode) and dispersion measures (range, variance, standard deviation).
CO4	Delve into probability basics, distributions (binomial, normal), and statistical inference, including hypothesis testing. Also, gain insights into linear regression with both simple and multiple variables.

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

1. M. Raghavachari, latest edition, Mathematics for Management: An Introduction, McGraw Hill Education.
2. Qazi Zameeruddin, latest edition, Vijay K. Khanna and S.K. Bhambri, Business Mathematics, S Chand.
3. Gupta S.P.& Gupta M.P., latest edition, Business Statistics, S.Chand (G/L) & Company Ltd.
4. D.N. Elhance, Veena Elhance and B.M. Aggarwal, latest edition, Fundamentals of Statistics, Kitab Mahal.
5. C.B. Gupta, latest edition, An Introduction to Statistical Methods, Vikas Publishing House Pvt Ltd.
6. Sancheti & Kapoor, latest edition, Business Mathematics, Sultan Chand & Sons.
7. Levin &Rubins, latest edition, Statistics for Business, Prentice Hall of India.