Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari Institute of Commerce
Semester-1(M.Com)

Subject: Quantitative methods for business decisions - MCOXX11502

Type of course: Major

Prerequisite:

A strong foundation in mathematics, encompassing algebra, calculus, and statistics, is essential for success in the "Quantitative Methods for Business Decisions" course. Proficiency in mathematical concepts and statistical tools is vital for effective analysis, resource optimization, and strategic decision-making in the corporate realm.

Rationale:

Quantitative tools empower organizations to make well-informed decisions by systematically addressing complex issues, quantifying uncertainties, and optimizing resource allocation, ultimately enabling competitive advantage in today's data-driven business landscape.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
CI	T	P	C	Theory Marks		Practical Marks	CA	
				ESE	MSE	V	ALA	
4	0	0	4	60	30	10	50	150

Legends: CI-ClassRoom Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Continuous Assessment:

(For each activity maximum-minimum range is 5 to 10 marks)

Sr. No	Active Learning Activities	Marks
1	**Measures of Central Tendency** Faculty will provide assignment and students will explain the practical applications of mean, median, mode, variance, and standard deviation in business analysis and provide an example where these measures are used in decision-making and upload it on Moodle.	10
2	**Linear Programming** Faculty will provide assignment and students will formulate a linear programming problem related to resource allocation or production planning and solve the problem using graphical methods and upload it on Moodle.	10
3	**Time Series Analysis** Students will collect time-series data related to a chosen variable (e.g., sales, stock prices) over a specified period and analyze the time series by identifying its components and upload it on Moodle.	10
4	**Hypothesis Testing** Faculty will provide topics and students will formulate a hypothesis related to a business problem or phenomenon and upload it on Moodle.	10
5	**Excel-based Modeling** Faculty will assign projects that involve building quantitative models students will perform in MS Excel and upload it on Moodle .	10
	Total	**50**

Course Content:

Sr. No	Course content	Hrs.	% Weightage
1	**Introduction to Quantitative Methods** Introduction to Quantitative Methods • Meaning, scope, and importance of quantitative methods in business decision-making • Role of quantitative techniques in solving business problems • Overview of statistical tools and techniques used in quantitative analysis Data Collection and Presentation • Types of data: Primary and secondary data • Data collection methods: Surveys, interviews, observations, etc. • Data presentation: Tabular representation, graphs, charts, and diagrams Measures of Central Tendency and Dispersion • Mean, median, mode, and their applications in business analysis • Measures of dispersion: Range, variance, and standard deviation • Interquartile range and coefficient of variation Probability and Probability Distributions • Basic concepts of probability theory • Probability distributions: Discrete and continuous distributions • Normal distribution, binomial distribution, and their applications in business	15	25

2	**Decision Analysis and Optimization**
	Decision Analysis
	  • Decision-making under certainty, risk, and uncertainty
	
	Linear Programming
	  • Introduction to linear programming (LP)
	  • LP formulation and graphical solution
	  • Simplex method for solving LP problems
	
	Transportation and Assignment Problems
	  • Transportation problem and its applications
	  • Assignment problem and its solution techniques
		15	25

3	**Forecasting and Time Series Analysis**
	Introduction to Forecasting
	  • Importance and challenges of business forecasting
	  • Types of forecasting techniques
	  • Data preparation and pre-processing for forecasting
	
	Time Series Analysis
	  • Components of a time series
	  • Trend analysis and smoothing methods
	  • Seasonality and seasonal adjustment techniques
	
	Forecasting Methods
	  • Moving averages and exponential smoothing
	  • Box-Jenkins methodology for autoregressive integrated moving average (ARIMA) models
		15	25

4	**Statistical Decision Making and Simulation**
	Hypothesis Testing and Statistical Inference
	  • Hypothesis formulation and testing procedures
	  • Confidence intervals and p-values
	  • Types of errors in hypothesis testing
	
	Regression Analysis
	  • Simple and multiple linear regression
	  • Model building, interpretation, and validation
	  • Assumptions of regression analysis
	
	Simulation and Monte Carlo Methods
	  • Introduction to simulation
	  • Monte Carlo simulation technique
	  • Applications of simulation in business decision making
		15	25

Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	20%	30%	30%	10%	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	Develop proficiency in utilizing quantitative tools and techniques to analyze and solve complex business problems effectively.
CO2	Apply statistical methods to analyze and interpret business data, enabling informed decision-making.
CO3	Acquire skills in optimization modeling and linear programming to optimize resource allocation and improve operational efficiency in business settings.
CO4	Demonstrate an understanding of probability theory and its applications in evaluating risks and making strategic decisions.
CO5	Develop the ability to use forecasting techniques to make accurate predictions and projections for business planning and budgeting purposes.

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] "Quantitative Methods for Business Decisions" by David Eadson, Jon Curwin

[2] "Quantitative Methods for Decision Makers" 5Th Edition by WISNIEWSKI

[3] "Quantitative Methods for Business"By R. Kipp Martin