

Branch Name:	MCA
Program Code:	CS201
Course Name:	Quantitative Techniques and Statistics
Course Code:	4CS2010105T
Pre-requisite Course:	Basic knowledge of mathematics, statistics fundamentals, and analytical thinking.

Course Objective:

1. To impart knowledge of statistical and quantitative techniques essential for analyzing data and making effective decisions in computing and IT.
2. To develop the ability to apply probability, statistical inference, optimization methods, and forecasting models to solve real-life and computing-related problems.
3. To develop analytical thinking and problem-solving skills by applying statistical and optimization methods to real-life and computing problems.
4. To enable students to effectively use modern statistical tools for data analysis, decision-making, and forecasting in computing and IT project environments.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
4	-	-	4	60	40	-	-	100

Course Contents

Unit No.	Topics	Total Hours	Weightage (%)
1	Introduction to Quantitative Techniques: Definition, nature, scope; classification of quantitative techniques; steps in quantitative analysis; fundamentals of mathematical modeling; applications in computing; limitations of QTs; overview of quantitative tools/software.	12	25
2	Descriptive Statistics and Probability Theory: Measures of central tendency; measures of dispersion; skewness & kurtosis; probability concepts; conditional probability; Bayes' theorem; random variables.	12	25
3	Probability Distributions & Inferential Statistics: Binomial, Poisson, Normal distributions; sampling methods; sampling distributions; estimation; hypothesis testing (z, t, chi-square tests).	12	25
4	Correlation, Regression, Time Series & Linear Programming: Correlation, regression analysis; time series components & forecasting; linear programming problem formulation; graphical & simplex methods; decision theory basics.	12	25

Text Books:

1. S.C. Gupta, V.K. Kapoor – Fundamentals of Mathematical Statistics, Sultan Chand & Sons.
2. Levin & Rubin – Statistics for Management, Pearson Education.
3. Richard I. Levin, David S. Rubin – Quantitative Approaches to Management, McGraw-Hill.

References Books:

1. Taha H.A. – Operations Research: An Introduction, Pearson Education.
2. Johnson & Wichern – Applied Multivariate Statistical Analysis, Pearson.
3. J.K. Sharma – Business Statistics, Pearson Education.
4. J.K. Sharma – Operations Research: Theory and Applications, Macmillan.
5. S.C. Gupta – Fundamentals of Statistics, Himalaya Publishing House.

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Explain the fundamentals and scope of quantitative techniques and mathematical modeling relevant to computing.	2 Understanding
CLO2	Apply descriptive statistical techniques to summarize and interpret data sets.	3 Applying
CLO3	Solve probability problems and use probability distributions for decision-making in computing scenarios.	3 Applying
CLO4	Perform hypothesis testing and interpret results for computing-related research and projects.	4 Analyzing
CLO5	Analyze and interpret correlation, regression, and time series data for forecasting in IT applications.	4 Analyzing
CLO6	Formulate and solve linear programming problems for resource optimization in computing projects.	3 Applying

Mapping of CLOs with Pos & PSOs:

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CLO1	H	M	M		M		M		M		M	M	H	M
CLO2	H	H	M				M		M		M	M	H	M
CLO3	H	H	M	M			M		M		M	M	H	M
CLO4	H	H	H	H			M	M	M		M	M	H	M
CLO5	H	M	H				H	M	M		M	M	H	H
CLO6	H	M	H	H	M		M	H	M		M	M	H	H

H:High, M:Medium, L:Low