

DEPARTMENT OF APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCE
M.C.A. I Year (I Semester)
MA 10210: STATISTICAL COMPUTING TECHNIQUES

HOURS PER WEEK			CREDITS			MAXIMUM MARKS				
T	P	TU	T	P	TU	THEORY		PRACTICAL		TOTAL MARKS
						C	END	SW	END	
						W	SEM		SEM	
4	2	--	3	1	-	30	70	--	--	100

COURSE OBJECTIVE

To introduce the concept of statistics, probability, forecasting methods and simulation.

COURSE OUTCOMES

After completion of the course, students are able to

- CO#1** use the probability concepts in problem solving
- CO#2** understand the basic statistical concepts and sampling theory
- CO#3** acquire the knowledge of correlation and regression
- CO#4** apply various forecasting methods in real life problems
- CO#5** understand and apply simulation techniques to a variety of engineering problems.

COURSE CONTENTS

THEORY

- Unit 1 Probability Theory: Mathematical and classical definition of probability. Addition theorem of probability, Multiplication theorem of probability, Conditional probability, Bayes theorem. Introduction to random variables and types of random variable.
- Unit 2 Statistics: Meaning and definitions. Uses and limitations of statistics, Measures of Central Tendency (Mean, Median, Mode), Measures of Dispersion (Mean Absoluter Deviation, Mean Squared Deviation, Standard Deviation). Sampling theory and test of hypothesis.
- Unit 3 Correlation and Regression Analysis: Importance and types of correlation. Karl-Parson and Spearman's Rank correlation coefficient. Lines of regression, Regression coefficient and their properties. Curve fitting methods of least squares.
- Unit 4 Forecasting Methods and Models: Qualitative and Quantitative. Time Series and Its Components, Analysis, Models of Time Series, Measurement of

Trend, Seasonal Variations and Cyclic Variations. Time Series Forecasting (Averaging methods, Moving Average, Exponential Smoothing method).

Unit 5 Statistical Simulation: Definition of random numbers, Properties of random numbers, Generation of pseudo-random numbers, Techniques for generating random numbers. Advantages and disadvantages of Simulation, Areas of application. Monte Carlo Simulation.

ASSESSMENT

1. Internal Assessment for continuous evaluation, mid-term tests, tutorials, class performance, etc.(30%)
2. End semester Theory Exam (70%).

TEXT BOOKS RECOMMENDED

1. S. C. Gupta, Fundamental of Statistics, Himalaya Publishing House Pvt. Ltd. New Delhi.
2. Ramesh Sircar, Statistical Techniques and Applications, New Control Book Agency, Kolkata.

REFERENCE BOOKS

1. S. Makridakis, S.C. Wheelwright and R.J. Hyndman, Forecasting Methods and Applications, John Wiley & Sons, NJ.
2. Irvin R. Miller, John E. Freund and R. Johnson, Probability and Statistics for Engineers, PHI Ltd. New Delhi.