With effect from: 2025-26 (R-23)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with A++ Grade

9-5-81, Ibrahimbagh, Hyderbad-500031

DEPARTMENT OF MATHEMATICS

ADVANCED PROBABILITY & STATISTICAL METHODS

(OPEN ELECTIVE)

For B.E., VI - Semester – CBCS

(Common to CSE, AIML & IT Branches)

Instruction: 3 Hours per week	**Semester End Exam Marks: 60**	**Subject Reference Code: U230E610MA**
Credits:3	**Sessional Marks: 40**	**Duration of Semester End Exam: 3 Hours**

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	***At the end of the course students will be able to:***
1. *Understand* fitting of a straight line to a given data and measuring Correlation between variables.	1. *Solve* problems on fitting of a straight line to the given data and also to find co-efficient of correlation and to determine regression lines and their application problems.
2. *Study* the concepts and application of Time series.	2. *Apply* concept of Time series to solve the real time problems.
3. *Distinguish* the various methods of Designs of Experiments	3. *Apply* the methods of Designs of Experiments
4. *Provide* the knowledge to the students about Prediction and control by statistical methods Regression and SQC.	4. *Evaluate* the performance measures of the systems in networks, transportation systems, production lines.
5. *Learn* the concept of pure birth and death models of Queuing theory.	5. *Apply* the comprehensive levels of Queuing theory for calculating service time, traffic intensity, queue length etc. in special and general queues.

UNIT – I: (8 Hours)

CORRELATION AND REGRESSION ANALYSIS

Correlation –Scatter diagrams-Spearman's Rank of Correlation-Curve fitting by the Method of Least Squares - Fitting of Straight line - Parabola - Exponential curves: $y = a\,e^{bx}$ & $y = a\,b^{x}$ - -- Regression - Lines of Regression - Multiple Regression - Curvilinear regression.

UNIT – II: (8 Hours)

TIME SERIES

Time series and Forecasting: Introduction-Moving averages, weighted average method smoothening of curves forecasting models and Methods.

UNIT – III: (8 Hours)

DESIGN OF EXPERIMENTS

Introduction to Design of experiments - Aim of the Design of experiments - Randomized Block Design (R.B.D) - Latin Square Design (L.S.D) - Comparison of RBD and LSD - Related problems.

UNIT – IV: (8 Hours)

QUEUEING THEORY

Introduction- Input pattern - service pattern- queue discipline - Queue behavior- Kendal's notation. Pure Birth and Death Models - Traffic intensity; (M/M/1: ∞/FIFO)-Model: (M/M/1: N/FIFO)-Model.

UNIT – V: (8 Hours)

STATISTICAL QUALITY CONTROL

Introduction, Methods for preparing control charts, variable charts – mean and range charts. Attribute charts- np, p and c charts.

TEXT BOOKS:

1. Probability, Statistics and Random Processes, T Veera Rajan, Tata McGraw-Hill companies (Seventh edition)
2. Probability & statistics and Random Processes; K.Murugesan & P.Gurusamy -Anuradha publishers
3. Probability & Statistics for Engineers, Miller& John E. Freund, Prentice Hall of India (Third edition)

REFERENCE BOOKS:

1. T.K.V. Iyengar et al, Probability and Statistics, S. Chand Publications, Revised edition.
2. Probability & Statistics for Engineers, Antony J. Hayter, CENGAGE Learning (India edition)

ONLINE SOURCES:

1. https://onlinecourses.nptel.ac.in/noc24_ch03
2. https://onlinecourses.nptel.ac.in/noc24_ma28

Prof.N.Kishan (OU Nominee)	Prof.M.A.Srinivas (Subject Expert-JNTUH)	Dr.J Jagan Mohan (Subject Expert-BITS, Hyd)	Dr.B.Srivathsa (Industry Expert)

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12/1/26