

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

## VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with A++ Grade

9-5-81, Ibrahimbagh, Hyderabad-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
<p><i>The course will enable the students to:</i></p> <ol style="list-style-type: none"><li>1. <i>Understand</i> fitting of a straight line to a given data and measuring Correlation between variables.</li><li>2. <i>Study</i> the concepts and application of Time series.</li><li>3. <i>Distinguish</i> the various methods of Designs of Experiments</li><li>4. <i>Provide</i> the knowledge to the students about Prediction and control by statistical methods Regression and SQC.</li><li>5. <i>Learn</i> the concept of pure birth and death models of Queuing theory.</li></ol>	<p><i>At the end of the course students will be able to:</i></p> <ol style="list-style-type: none"><li>1. <i>Solve</i> 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.</li><li>2. <i>Apply</i> concept of Time series to solve the real time problems.</li><li>3. <i>Apply</i> the methods of Designs of Experiments</li><li>4. <i>Evaluate</i> the performance measures of the systems in networks, transportation systems, production lines.</li><li>5. <i>Apply</i> the comprehensive levels of Queuing theory for calculating service time, traffic intensity, queue length etc. in special and general queues.</li></ol>
<p><b>UNIT – I: (8 Hours)</b></p> <p><b>CORRELATION AND REGRESSION ANALYSIS</b></p> <p>Correlation –Scatter diagrams-Spearman's Rank of Correlation-Curve fitting by the Method of Least Squares - Fitting of Straight line - Parabola - Exponential curves: <math>y = a e^{bx}</math> &amp; <math>y = a b^x</math> - Regression - Lines of Regression - Multiple Regression - Curvilinear regression.</p>	

#### 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- Kendall's notation. Pure Birth and Death Models - Traffic intensity; (M/M/1:  $\infty$ /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:**

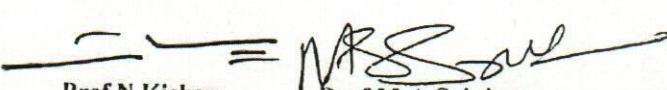
1. Probability, Statistics and Random Processes, T Veera Rajan, Tata McGraw-Hill companies (Seventh edition)
2. Probability & statistics and Random Processes; K.Murugesan & P.Gurusamy -Anuradha publishers
3. Probability & Statistics for Engineers, Miller& John E. Freund, Prentice Hall of India (Third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

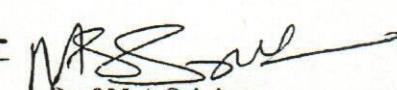
#### **REFERENCE BOOKS:**

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)

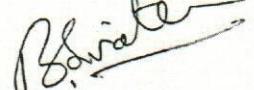
#### **ONLINE SOURCES:**

1. [https://onlinecourses.nptel.ac.in/noc24\\_ch03](https://onlinecourses.nptel.ac.in/noc24_ch03)
2. [https://onlinecourses.nptel.ac.in/noc24\\_ma28](https://onlinecourses.nptel.ac.in/noc24_ma28)

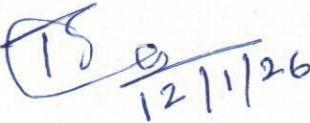
  
Prof. N. Kishan  
(OU Nominee)

  
Prof. M.A. Srinivas  
(Subject Expert-JNTUH)

  
Dr. Jagan Mohan  
(Subject Expert-BITS, Hyd)

  
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(Industry Expert)

  
Dr. T. Sudhakar Rao  
(Chairman, BOS)

  
12/11/26