**II Year – I SEMESTER**

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| **3+1** | **0** | **3** |

## PROBABILITY AND STATISTICS
### (Common to CE, CSE, IT, Chemical, PE, PCE, Civil Branches)

**UNIT I Random variables and Distributions:**

Introduction- Random variables- Distribution function- Discrete distributions (Review of Binomial and Poisson distributions)

Continuous distributions: Normal, Normal approximation to Binomial distribution, Gamma and Weibull distributions.

Subject Category

ABET Learning Objectives   a b e k

ABET internal assessments   1 2 6

JNTUK External Evaluation  A B E

**UNIT II Moments and Generating functions:**

Introduction-Mathematical expectation and properties - Moment generating function - Moments of standard distributions ( Binomial, Poisson and Normal distributions) – Properties.

Subject Category

ABET Learning Objectives   a e

ABET internal assessments   1 2 6

JNTUK External Evaluation  A B E

**UNIT III Sampling Theory:**

Introduction - Population and samples- Sampling distribution of mean for large and small samples (with known and unknown variance) - Proportion sums and differences of means -Sampling distribution of variance -Point and interval estimators for means and proportions.

Subject Category

ABET Learning Objectives   a e k

ABET internal assessments   1 2 6

JNTUK External Evaluation  A B E

**UNIT IV Tests of Hypothesis:**

Introduction - Type I and Type II errors - Maximum error - One tail, two-tail tests- Tests concerning one mean and proportion, two means- Proportions

and their differences using Z-test, Student's t-test - F-test and Chi -square test - ANOVA for one-way and two-way classified data.

Subject Category

ABET Learning Objectives   a b d e h k

ABET internal assessments   1 2 6 7 10

JNTUK External Evaluation  A B D E F

## UNIT V Curve fitting and Correlation:

Introduction - Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares.

Simple Correlation and Regression - Rank correlation - Multiple regression

Subject Category

ABET Learning Objectives   a d e h k

ABET internal assessments   1 2 6 10

JNTUK External Evaluation  A B E

## UNIT VI Statistical Quality Control Methods:

Introduction - Methods for preparing control charts – Problems using x-bar, p,  R charts and attribute charts

Subject Category

ABET Learning Objectives   a e k

ABET internal assessments   1 2 6

JNTUK External Evaluation  A B E F

**Books:**

1. Probability and Statistics for Engineers: Miller and John E. Freund, Prentice Hall of India.
2. Probability and Statistics for Engineers and Scientists: Ronald E. Walpole, Sharon L. Mayers and Keying Ye: Pearson.
3. Probability, Statistics and Random Processes, Murugesan, Anuradha Publishers, Chenai.

| Subject Category | ABET Learning Objectives | ABET Internal Assessments | JNTUK External Evaluation | Remarks |
|---|---|---|---|---|
| Theory Design Analysis Algorithms Drawing Others | a) Apply knowledge of math, science, & engineering<br>b) Design & conduct experiments, analyze & interpret data<br>c) Design a system/process to meet desired needs within economic, social, political, ethical, health/safety, manufacturability, & sustainability constraints<br>d) Function on multidisciplinary teams<br>e) Identify, formulate, & solve engineering problems<br>f) Understand professional & ethical responsibilities<br>g) Communicate effectively<br>h) Understand impact of engineering solutions in global, | 1. Objective tests<br>2. Essay questions tests<br>3. Peer tutoring based<br>4. Simulation based<br>5. Design oriented<br>6. Problem based<br>7. Experiential (project based) based<br>8. Lab work or field work based<br>9. Presentation based<br>10. Case Studies based<br>11. Role-play based<br>12. Portfolio based | A. Questions should have:<br>B. Definitions, Principle of operation or philosophy of concept.<br>C. Mathematical treatment, derivations, analysis, synthesis, numerical problems with inference.<br>D. Design oriented problems<br>E. Trouble shooting type of questions<br>F. Applications related questions<br>G. Brain storming questions | |

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| | economic, environmental, & societal context<br>i) Recognize need for & be able to engage in lifelong learning<br>j) Know contemporary issues<br>k) Use techniques, skills, modern tools for engineering practices | | | |