

# AMPE07 PROBABILITY AND STATISTICS

## UNIT-1 RANDOM VARIABLES

- 1.1 Discrete and continuous random variables
- 1.2 Moments – Moment generating functions
- 1.3 Binomial, Poisson, Geometric,
- 1.4 Uniform, Exponential,
- 1.5 Gamma and Normal distributions.

## UNIT-2 TWO- DIMENSIONAL RANDOM VARIABLES

- 2.1 Joint distributions- Marginal and conditional distributions
- 2.2 Covariance- Correlation and Linear regression
- 2.3 Transformation of random variables
- 2.4 Central limit theorem (for independent and identically distributed random variables).

## UNIT-3 TESTING OF HYPOTHESIS

- 3.1 Sampling distributions- Estimation of parameters
- 3.2 Statistical hypothesis
- 3.3 Large sample test based on Normal distribution for single mean and difference of means- Tests based on t,
- 3.4 Chi-square and F distributions for mean, variance and proportion- Contingency table (test for independent) - Goodness of fit.

## UNIT-4 DESIGN OF EXPERIMENTS

- 4.1 One way and two way classifications
- 4.2 Completely randomized design
- 4.3 Randomized block design
- 4.4 Latin square design -  $2^2$  factorial design.

## UNIT-5 STATISTICAL QUALITY CONTROL

- 5.1 Control charts for measurements (X and R charts)- Control charts for attributes (p, c and np charts)
- 5.2 Tolerance limits - Acceptance sampling.

### References Books:

1. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2012.
2. Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", Pearson Education, Asia, 8th Edition, 2007.