

**IK Gujral Punjab Technical University**  
**Bachelor of Technology (B. Tech. 1<sup>st</sup> Year)**

<b>BTA204-18</b>	<b>Mathematics Paper-II</b> <b>(Probability &amp; Statistics)</b>	<b>4L:1T:0P</b>	<b>4 credits</b>
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**Course Objective:**

The objective of this course is to familiarize the students with statistical techniques. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling various problems in the discipline.

**Detailed Content:**

**Section-A**

**Unit I: (10 hours)**

Measures of Central tendency: Moments, skewness and kurtosis, Variance, Correlation coefficient, Probability, conditional probability, independence; Discrete random variables, Independent random variables, expectation of Discrete random variables.

**Unit II: (15 hours)**

Probability distributions: Binomial, Poisson and Normal, Poisson approximation to the binomial distribution, evaluation of statistical parameters for these three distributions, Correlation and regression – Rank correlation.

**Section-B**

**Unit III: (10 hours)**

Continuous random variables and their properties, distribution functions and densities, normal and exponential densities. Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas.

**Unit IV: (15 hours)**

Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means, and difference of standard deviations.

Test for single mean, difference of means and correlation coefficients, test for ratio of variances - Chi-square test for goodness of fit and independence of attributes.

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**Suggested Text/Reference Books**

Erwin Kreyszig, Advanced Engineering Mathematics, 9<sup>th</sup> Edition, John Wiley & Sons, 2006.

P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall, 2003 (Reprint).

S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002.

W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3<sup>rd</sup> Ed., Wiley, 1968.

N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2010.

B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.

T. Veerarajan, Engineering Mathematics (for semester III), Tata McGraw-Hill, New Delhi, 2010.

**Course Outcomes:** The students will learn:

- The ideas of probability and random variables and various discrete and continuous probability distributions and their properties. The basic ideas of statistics including measures of central tendency, correlation and regression and the statistical methods of studying data samples.
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