

**SEMESTER 2**

| Course Code | Course Name                | Course Type | Cd | L | T | P | Marks     |            |       |
|-------------|----------------------------|-------------|----|---|---|---|-----------|------------|-------|
|             |                            |             |    |   |   |   | Sessional | Final Exam | Total |
| BSC-201     | Engineering Mathematics-II | BSC         | 5  | 3 | 2 | 0 | 50        | 100        | 150   |

**Course Outcomes**

|  |   |
|--|---|
| At the end of the course the student will be able to |   |
| CO1  | To understand probability and random variables and various discrete and continuous probability distributions and their properties |
| CO2  | Calculate probabilities, and derive the marginal and conditional distributions of bivariate random variables                      |
| CO3  | Analyse statistical data using measures of central tendency, dispersion and location  |
| CO4  | Understand and discuss the issues surrounding sampling and significance   |
| CO5  | Develop analytical skills in structuring and interpreting the business problems statistically                                     |

**Detailed Syllabus****Section-A**

**Unit 1:** Probability spaces, conditional probability, independence; Discrete random variables, Independent random variables, the multinomial distribution, Poisson approximation to the binomial distribution, infinite sequences of Bernoulli trials, sums of independent random variables; Expectation of Discrete Random Variables, Moments, Variance of a sum, Correlation coefficient, Chebyshev's Inequality. **(9 Hrs)**

**Unit 2:** Continuous random variables and their properties, distribution functions and densities, normal, exponential and gamma densities. Bivariate distributions and their properties, distribution of sums and quotients, conditional densities, Bayes' rule.

**(12 Hrs)**

**Unit 3:** Measures of Central tendency: Moments, skewness and Kurtosis - Probability distributions. Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions, Correlation and regression – Rank correlation **(10 Hrs)**

**Section-B**

**Unit 4:** Hypothesis – Introduction, Format and Types; Procedure of Hypothesis Testing; Errors in Hypothesis; Two-tail and One-tail Test of Hypothesis; Tests of Significance for Attributes; Tests of Significance for Variables; Tests of Significance for Small Samples; t-distribution and its application

**(11 Hrs)**

**Unit 5:** Difference of means and correlation coefficients, test for ratio of variances - Chi-square test for goodness of fit and independence of attributes **(10 Hrs)**

**Text Books**

| S. No. | Name of the Books  | Author          | Publisher               | Edition (Pub. Yr.)     |
|--------|--|-----------------|-------------------------|------------------------|
| 1      | Advanced Engineering Mathematics   | Erwin Kreyszig  | Wiley                   | 10th (2015)            |
| 2      | A First Course in Probability  | S. Ross         | Pearson Education India | 6th (2002)             |
| 3      | “Introduction to Probability and Statistics for Engineers and Scientists | Sheldon M. Ross | Academic Press          | 5 <sup>th</sup> (2009) |

**Reference Books**

| S.No. | Name of the Books                | Author                      | Publisher                         | Edition (Pub. Yr.) |
|-------|----------------------------------|-----------------------------|-----------------------------------|--------------------|
| 1     | Advanced Engineering Mathematics | R.K. Jain, S. R. K. Iyenger | Narosa Publishing House Pvt. Ltd. | 5th (2016)         |
| 2     | Higher Engineering Mathematics   | Dr. B. S. Grewal            | Khanna Publications               | 43rd (2017)        |
| 3     | Engineering Mathematics          | N.P Bali                    | Laxmi publications                | 13th (2009)        |