17SH2106–PROBABILITY AND STATISTICS

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| **Course Category:** | Basic Sciences | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture – Tutorial – Practical:** | 2-2-0 |
| **Prerequisite:** | Intermediate Mathematics | **Sessional Evaluation:****Univ.Exam Evaluation:****Total Marks:** | 4060100 |
| **Objectives** | To make the student learn about* The concept of probability, Conditional Probability and Bayes theorem.
* Explain various descriptive statistics including the mean, variance and standard deviation for a given data set.
* Binomial, Poisson and Normal distributions.
* The basic concepts of Sampling Distribution.
* Test of Hypothesis concerning one mean and two means.
* Student-t-test, F-test and Chi-square [𝝌2] test.
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| **Course Outcomes** | Upon successful completion of the course, the students will be able to: |
| CO1 | Have a fundamental knowledge of the basic probability concepts. |
| CO2 | Understand effectively the basic concepts of discrete, continuous random variables and statistical parameters of distribution functions. |
| CO3 | Have a well-founded knowledge of standard distributions (Binomial, Poisson and Normal distributions) which can describe real life phenomena. |
| CO4 | Have a good grasp ofSampling distribution of the mean proportions, Sums and differences, Point Estimation and Interval Estimation. |
| CO5 | Attains skills in analyzingtheTest of hypothesis and Test of significance |
| CO6 | Have a good grasp ofStudent-t-test, F-test and Chi-square [𝝌2] test. |
| **Course Content** | UNIT-I**Probability:** Sample Space and Events - Axioms of Probability - Some Elementary theorems - Conditional Probability - Bayes theorem. UNIT-II**Random variables:** Discrete and continuous random variables - probability functions - Statistical Parameters (Mean, Variance and Standard Deviation) of distribution functionsUNIT-III**Probability Distributions**: Binomial distribution - Poisson distribution - Normal distribution.UNIT-IV**Sampling Distributions**: Population and Samples - Sampling distribution of the mean proportions, Sums and differences. Estimation: Point Estimation - Interval Estimation and Bayesian Estimation.UNIT-V**Test of Hypothesis:** Test of hypothesis and Test of significance - Hypothesis concerning one mean and two means - Type – I and Type – II errors - One tail and two tail tests. .UNIT-VI**Testing of Significance (Small Samples):**Student-t-test - F-test - Chi-square [𝝌2] test - 𝝌2 test of goodness of fit. |
| **Text Books and References:** | **Text Books:**1. Probability and Statistics for Engineers - [G. S. S. BhishmaRao](https://www.bookdepository.com/author/G-S-S-Bhishma-Rao), Scitech Publications (India) Pvt Ltd, New Delhi.
2. Probability and statistics - Dr.T.K.V. Iyengar, Dr.B. Krishna Gandhi, S.Ranganatham, Dr.M.V.S.S.N. Prasad, S. Chand Publication, New Delhi.
3. Probability and Statistics for Engineers and Scientists – Ronald E. Walpole, Sharon L.Myers and Keying Ye, Pearson 8th edition.

**Reference Books:**1. Probability & Statistics - E. Rukmangadachari, E. Keshava Reddy, Pearson Publisher, New Delhi.
2. Probability & Statistics for Engineers- Miller and John Freund. E, Pearson Education, New Delhi.
3. Higher Engineering Mathematics - B. S. Grewal, Khanna Publications, New Delhi
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| **E-Resources** | 1. [**https://nptel.ac.in/courses**](https://nptel.ac.in/courses)
2. [**https://freevideolectures.com/university/iitm**](https://freevideolectures.com/university/iitm)
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