# ITM(SLS) Baroda University
## School of Computer Science, Engineering, and Technology
## B. Tech Computer Science and Information Technology
## Semester-VII

**Course Name: Probability and Statistical Modelling for Computer Science**
**Course Code: Core**
**Course Type: C2710D4**
**Teaching Scheme:**

| Teaching Scheme | | | Credit | Examination Marks | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|
| L | T | P | C | Theory | | Practical | | 150 |
| 4 | 0 | 2 | 6 | Internal | External | Internal | External | |
| | | | | 60% | 40% | 50 | ---- | |

**Course Objective:** The main objectives of this course are to give students a foundational comprehend of descriptive statistics, probability, conditional probability, and independent events. Designing a statistical hypothesis regarding a real-world situation and being familiar with hypothesis testing are both the main goals of the course. The course will give students the chance to study Sci-Lab programming to a significant extent.

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|---|---|
| **Unit-1** | Introduction to Statistics- Origin, Meaning, and Purpose of Statistics, Scope, and Limitations of Statistics. Collection and Presentation of Data, Frequency Distributions Continuous Frequency Distribution, Graphical representation of data. Measures of Central Tendency- Mean, Median, Mode, Merits, and Demerits. Average of positions, Measures of Dispersion- Range, Quartile, Mean Deviation, Standard Deviation, Coefficient of Variations, Standard Deviation. Skewness, Kurtosis (Theory only). |
| **Unit-2** | Concept of Probability- Definition of Probability, Classical and Empirical Probability, Additions and Multiplication Rule of Probability, Conditional Probability, Simple Problems. Revision of Probability, Bayes' theorem. Introduction to Random variable. Probability Distribution- Binomial Distribution and Poisson Distribution and Normal Distribution. |
| **Unit-3** | Correlation - Introduction of Correlation, Correlation Analysis- Significance and Types of Correlation- Positive, Negative, No Correlation, Linear & Non-Linear Correlation, Measure of Correlation- Scatter Diagram, Karl Pearson's Correlation, Spearman's Co-efficient Correlations. |
| | Regression Analysis- Introduction of Regressions, Lines of Regressions, Properties of Regression Lines, Regression Co-efficient and their properties. |
| **Unit-4** | Hypothesis- Definition, Types, Formulation of Hypothesis, Testing of Hypothesis, T-Test, Z-Test, Chi-Square. |

**Text Book:**

- Sheldon M. Ross, “Introduction to Probability and Statistics for Engineers and Scientists.” 3rd ed., Elsevier Academic Press.
- Douglas C. Montgomery, C. Runger, “Applied Statistics and Probability for Engineers” 5th ed., John Wiley & Sons.

**Reference Book:**

- Ken Black, “Business Statistics for Contemporary Decision Making” Wiley (Latest Edition)
- Naval Bajpai, “Business Statistics” Pearson (Latest Edition)
- Jay L. Devore,” Probability and Statistics for Engineering and the Sciences”, Eighth Edition.

**Practical List: Scilab for**

1. Descriptive statistics (Relative frequency, Mean, Median, Mode).
2. Variance, Quartiles.
3. Correlation, Regression.
4. Hypothesis testing.