**Statistics**

**Key Concepts**

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| Basic probability concepts, Conditional probability, Bayes Theorem, Probability distributions, Continuous and discrete distributions, Transformation of random variables, estimating mean, variance, covariance, Hypothesis Testing, Maximum likelihood, ANOVA – single factor, dual factor, time series analysis: AR, MA, ARIMA, SARIMA, sampling based on distribution, statistical significance, Gaussian Mixture Model, Expectation Maximization. |

**Text Books**

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| **No** | **Author(s), Title, Edition, Publishing House** |
| T1 | Statistics for Data Scientsists, An introduction to probability ,statistics and Data Analysis,MauritsKaptein et al,Springer 2022 |
| T2 | Probability and Statistics for Engineering and Sciences,8th Edition, Jay L Devore, Cengage Learning |

**Module 1: Basic Probability &Statistics**

**Module 2: Conditional Probability & Bayes theorem (Naive Bayes)**

**Module 3: Probability Distributions (**Random Variables, Probability Distributions)

**Module 4: Hypothesis Testing (**Sampling – random sampling and Stratified sampling**,** Sampling distribution – Cental Limit theorem, Interval Estimation,Confidence level, Testing of Hypothesis)

**Module 5:Prediction & Forecasting (**Correlation, Regression, Time Series Analysis)

**Module 6: Gaussian Mixture model & Expectation Maximization**