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| **Week** | **Theory Contents/Topics** | **Sections** | **CLO** | **Tools** |
| 1 | **Descriptive statistics:**  Basic definition , Types of variables ,Mean, Median, Mode, Variance, Standard Deviation, Quartiles, Deciles, Percentiles, IQ Range | WP [1.1, 1.3, 1.4, 1.6] &  NW [ 2.1 – 2.4, 3.1 – 3.4] | 1 |  |
| 2 | **Graphical representation of data:**  Construction of bar chart , histograms, Stem-leaf plots, box plot, ogive, frequency curve, Skewness and Kurtosis. | WP [1.3, 1.6] & NW [ 2.2 – 2.4] | 1 | A1, M1, F |
| 3 | **Sample Space and Event:**  Sample point, tree diagram, set theory , Venn diagram | WP [ 2.1 – 2.3] | 1 |  |
| 4 | Counting techniques, Probability of an event, Additive rules | WP [2.4 – 2.5] | 1 |  |
| 5 | **Axioms of Probability:**  Conditional Probability, Independence and Multiplicative rules. Bayes’ Rules | WP [ 2.6 – 2.7] | 2 |  |
| 6 | **1st Mid Term Exam** |  |  |  |
| 7 | **Random Variables & Probability Distributions:**  Concept of random variable, **Discrete Probability Distribution**, PMF, CDF, joint probability distribution, marginal distribution | WP [3.1-3.2, 3.4] | 1, 2 |  |
| 8 | **Continuous Probability Distributions** PDF and CDF  Joint Probability Distribution, marginal distribution | WP [ 3.3, 3.4] | 2 |  |
| 9 | **Mathematical Expectations:**  Mean & Variance of a Random Variable, Covariance, and Correlation | WP [4.1, 4.2] | 2 | A2, M2, F |
| 10 | Binomial, Poisson, Multinomial, Geometric, hypergeometric, Uniform, Normal and standard normal distributions and applications | WP [ 5.1, 5.2, 5.5, 6.2 – 6.4] | 2 |  |
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| 11 | **2nd Mid Term Exam** |  |  |  |
| 12 | **Estimation & Hypothesis Testing:**  Introduction, confidence interval estimation using z & t distributions for single mean and difference between two means, Testing of hypothesis for single mean and difference between two means using z-test p-value method | WP [ 9.1 – 9.5, 9.8, 10.1 – 10.5] | 2, 3 |  |
| 12 | **Independent & Dependent sample tests:**  One-sample t-test, independent and dependent sample t-tests, confidence intervals | WP [ 9.1 – 9.5, 9.8, 10.1 – 10.5] | 3 | A3, F |
| 14 | **Regression & Correlation:**  Scattered diagram. Introduction to linear regression.  The simple linear regression model  Simple Correlation coefficient of determination | WP [ 11.1 – 11.3. 11.12] | 2, 3 |  |
| 15 | **Multiple linear Regression:**  Multiple regression and correlation, coefficient of determination, assumptions | WP [12.1 – 12.2] | 2, 3 |  |
| 16 | **Analysis of variance:**  ANOVA | WP [13.1, 13.2] | 3 |  |
| 17 | **Final Exam** |  |  |  |