

**Total IKS Hrs for Sem. : Hrs**

Abbreviations: CL- ClassRoom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, \*# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.\* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. \* Self learning hours shall not be reflected in the Time Table.
7. \* Self learning includes micro project / assignment / other activities.

**V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT**

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	<p>TLO 1.1 Solve problems based on Frequency Distribution.</p> <p>TLO 1.2 Calculate Mean, Median and Mode for all types of data.</p> <p>TLO 1.3 Find Mode and Median using Graphical method.</p> <p>TLO 1.4 Find Karl Pearson's and Bowley's Co-efficient of Skewness for the given data.</p> <p>TLO 1.5 Calculate the Measures of Kurtosis based on moment for given data.</p>	<p><b>Unit - I Statistical Techniques</b></p> <p>1.1 Frequency Distribution: Definition, Basic terms.</p> <p>1.2 Classification of Data: Raw, Ungroup and Group data.</p> <p>1.3 Measures of Central Tendency: Mean, Median and Mode for all types of data.</p> <p>1.4 Concept of Quartiles, Deciles and Percentiles for all types of data.</p> <p>1.5 Geometric mean and Harmonic mean and Combined mean for given data.</p> <p>1.6 Graphical Representation to find Mode (Histogram) and Median (Ogive curve ).</p> <p>1.7 Measures of Dispersion: Range, Mean Deviation, Standard Deviation, Variance.</p> <p>1.8 Skewness: Types of skewness, Test of skewness, Co-efficient of skewness-Karl Pearson's and Bowley's coefficient.</p> <p>1.9 Types of skewness in terms of Mean and Mode.</p> <p>1.10 Measures of Kurtosis using central moment.</p>	<p>Classroom Lecture</p> <p>Flipped Classroom</p> <p>Demonstration</p>

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
2	<p>TLO 2.1 Fit straight line and second-degree polynomial using Least Square method.</p> <p>TLO 2.2 Calculate Coefficient of correlation using Karl-Pearson's and Spearman's Rank methods.</p> <p>TLO 2.3 Obtain the equation to the Line of Regression for the given data.</p>	<p><b>Unit - II Statistical Methods</b></p> <p>2.1 Fitting of Straight Line <math>y = a+bx</math> using method of least square.</p> <p>2.2 Fitting of second degree polynomial <math>y=a+bx+cx^2</math> using method of least square.</p> <p>2.3 Covariance of the data.</p> <p>2.4 Correlations, Types of Correlations.</p> <p>2.5 Scatter Or Dot-Diagram.</p> <p>2.6 Karl-Pearson's and Spearman's Rank Coefficient of Correlation.</p> <p>2.7 Regression Equation of line in two variables.</p>	<p>Classroom Lecture Flipped Classroom Demonstration</p>
3	<p>TLO 3.1 Solve problems using addition and multiplication probability theorem.</p> <p>TLO 3.2 Solve problems using Conditional Probability.</p> <p>TLO 3.3 Solve problems using Bayes' theorem.</p>	<p><b>Unit - III Probability of Random Variable</b></p> <p>3.1 Probability : Definition, Terminologies.</p> <p>3.2 Theorem of Probability: Addition, Multiplication.</p> <p>3.3 Conditional probability.</p> <p>3.4 Bayes' theorem.</p>	<p>Classroom Lecture Flipped Classroom Demonstration</p>
4	<p>TLO 4.1 Solve problems using Lagrange's interpolation formula.</p> <p>TLO 4.2 Construct forward and backward difference table.</p> <p>TLO 4.3 Solve problems using Forward, Backward, Shift, Inverse shift operators.</p> <p>TLO 4.4 Solve problems on Forward and Backward Interpolation.</p> <p>TLO 4.5 Solve problems on Extrapolation.</p>	<p><b>Unit - IV Interpolation</b></p> <p>4.1 Introduction.</p> <p>4.2 Lagrange's Interpolation formula.</p> <p>4.3 Finite Differences: Forward difference, Backward difference, Shift operator, Inverse shift operator.</p> <p>4.4 Relation between forward, backward, shift and inverse shift operator.</p> <p>4.5 Newton's Gregory forward and backward difference Interpolation Formula.</p> <p>4.6 Concept of Extrapolation.</p>	<p>Classroom Lecture Flipped Classroom Presentations</p>
5	<p>TLO 5.1 Solve the given problem using Sampling distribution proportion.</p> <p>TLO 5.2 Test samples using t-Distribution.</p> <p>TLO 5.3 Test samples using chi-Square Distribution.</p> <p>TLO 5.4 Use Chi-Square test to test the Independence.</p>	<p><b>Unit - V Sampling Methods</b></p> <p>5.1 Population, Sampling, Aim of Sampling, Parameters and Statistic, Types of Sampling, Standard Error.</p> <p>5.2 Hypothesis: Null Hypothesis and Alternating Hypothesis.</p> <p>5.3 Level of Significance, Test of Significance and Confidence Limits.</p> <p>5.4 Test of Significance of Large Samples (<math>N&gt;30</math>).</p> <p>5.5 Sample Distribution of the proportion.</p> <p>5.6 Comparison of Large Samples.</p> <p>5.7 The t-Distribution (For Small Samples).</p> <p>5.8 Chi-Square Distribution, Condition for Chi Square test.</p> <p>5.9 Degree of freedom.</p> <p>5.10 Chi-Square Test of Goodness of fit and Chi-Square test as a test of Independence.</p>	<p>Classroom Lecture Presentations Demonstration</p>