

Semester	<b>THREE</b>
PaperNumber	<b>11A</b>
PaperCode	<b>MDTSG 4313</b>
PaperTitle	<b>Interdisciplinary Paper (Data Analytics)</b>
No.ofCredits	<b>3 + 3</b>
CourseDescription	<b>11A:</b> Interdisciplinary Elective; 2 Theory + 2 Practical Classes/ week <b>11B:</b> Elective; 3 Theory classes/week
CourseObjective	<b>11A: Interdisciplinary Paper</b> At the end of the course, a student is expected to <ol style="list-style-type: none"> <li>1. Identify the different forms of data.</li> <li>2. Visually represent different types of data using standard softwares.</li> <li>3. Carry out analysis of metric data by using different measures.</li> <li>4. Learn the genesis of different probability distributions and choose them appropriately to fit a given data.</li> <li>5. Fit simple linear regression models to multivariate data.</li> <li>6. Understand the basic concepts of inferential statistics, estimate and test hypotheses of parameters of interest in different setups.</li> </ol>
Syllabus	<b>11A- Interdisciplinary Paper</b> <b>Data:</b> Population and Sample. Classification of data according to the nature of the characteristic being measured. Types of Data- Time Series, Cross Sectional, Categorical, Spatial, Longitudinal/Panel, Spatio Temporal. Scales of Measurement. (4L) <b>Diagrammatic Representation:</b> Exploratory Data Analysis. Visual Presentation of different types of data. (2L) <b>Descriptive Statistics:</b> Moment and Quantile Measures of univariate data. Product Moment correlation, linear regression, Odds Ratio of contingency tables. Multiple linear regression. Logistic regression. Outliers. (4L) <b>Probability Theory:</b> Random variable. Binomial, Poisson, Normal. (7L) <b>Statistical Methods:</b> Statistic and Parameter. Concept of Sampling distribution. Estimate and standard error. Confidence Intervals. Tests for means. Analysis of variance tests for one way and two way layout. Pearsonian chi-square tests in contingency tables. (9L)
List of Practical	Based on the theory topics
Reading/Reference Lists	<b>11A- Interdisciplinary Paper</b> <ol style="list-style-type: none"> <li>1. The Visual Display of Quantitative Information (2nd Edition). E. Tufte. Graphics</li> <li>2. Hogg, R.V., Tanis, E.A. and Rao J.M. (2009): Probability and Statistical Inference, Seventh Ed, Pearson Education, New Delhi.</li> <li>3. Moulin, P. and Venugopal, V.V., Statistical Inference for Engineers and Data Scientists, Cambridge University Press.</li> <li>4. Ismay, C. and Kim, A.Y., Statistical Inference via Data Science, A Modern Dive into R and the Tidyverse, CRC Press Talor and Francis group, 2020.</li> </ol>

<b>Evaluation</b>			
<b>11A: Interdisciplinary Paper</b>		<b>11B: Advanced Regression Techniques</b>	
Theory	Practical	Theory	Practical
CIA: 5	Continuous Assessment: 15	CIA: 5	Continuous Assessment: 15
End Sem Exam: 25	End Sem Viva: 5	End Sem Exam: 25	End Sem Viva: 5
Total : 30	Total: 20	Total : 30	Total: 20
<b>Paper Structure</b>			
<b>11A: Interdisciplinary Paper</b>		<b>11B: Advanced Regression Techniques</b>	
5 Marks question: 1 out of 2		5 Marks question: 1 out of 2	
10 Marks question: 2 out of 3		10 Marks question: 2 out of 3	