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| Semester                     | <b>SIX</b>   |
| Paper Number                 | <b>HSTDS6032T &amp; HSTDS6032P</b>   |
| Paper Title                  | <b>Econometrics</b>  |
| No. of Credits               | <b>6</b>   |
| Theory/Composite             | <b>Composite</b>   |
| No. of periods assigned      | Th: 4<br>Pr: 3   |
| Module                       | Single   |
| Course description/objective | <p><i>At the end of the course students should</i></p> <ul style="list-style-type: none"> <li>○ Knowledge of the concept of Economic Modelling.</li> <li>○ Knowledge of the difference between an economic and an econometric model.</li> <li>○ Knowledge about the Gauss-Markov linear model elaborately and the corresponding inferential problems.</li> <li>○ Elaborate knowledge about the phenomena - Heteroscedasticity, Autocorrelation and Multicollinearity.</li> <li>○ Knowledge of the tools for detection of Heteroscedasticity, Autocorrelation and Multicollinearity of the above model, some of their effects.</li> <li>○ Knowledge of the remedial measures.</li> <li>○ Knowledge of validating economic model through the econometric tools.</li> </ul>   |
| Syllabus                     | <p><b>UNIT1:</b><br/><b><i>What is Econometrics:</i></b> Comparing mathematical and econometric model with illustrative examples – consumption and production function, Stages of econometric methodology, Review of simple linear regression model.<br/><b>Regression Diagnostics:</b> Residual plots, outliers, leverage and influential data points, Cook’s distance.<br/>[10L]</p> <p><b>UNIT 2:</b><br/><b><i>Heteroscedasticity:</i></b> Nature of heteroscedasticity – illustrative examples, OLS method under heteroscedasticity and its consequences, detecting heteroscedasticity – residual plot, Glejser test, Goldfeld-Quandt test, remedial measure through variable transformation and generalized least squares (GLS).<br/>[15L]</p> <p><b>UNIT 3:</b><br/><b><i>Autocorrelation:</i></b> Nature of autocorrelation – illustrative examples, OLS method under autocorrelation – AR(1) model, detecting autocorrelation – residual plot, Runs test, Durbin-Watson test, GLS method for correcting autocorrelation.<br/>[12L]</p> <p><b>UNIT 4:</b><br/><b><i>Multicollinearity:</i></b> Nature of multicollinearity – illustrative examples, OLS method under perfect multicollinearity and its</p> |

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|                                    | consequences, detecting multicollinearity – thumb rules based on $R^2$ , pair-wise and partial correlations, remedial measures via more data, dropping and transformation of variables. [15L]   |   |
| List of Practical                  | <ol style="list-style-type: none"> <li>1. Fitting of ordinary linear regression equations with diagnostics.</li> <li>2. Tests of heteroscedasticity.</li> <li>3. Fitting of regression equation after making adjustments for heteroscedasticity.</li> <li>4. Tests of autocorrelation.</li> <li>5. Fitting of regression equation after making adjustments for autocorrelation.</li> <li>6. Tests of multicollinearity.</li> <li>7. Fitting of regression equation after making adjustments for multicollinearity.</li> </ol> |   |
| Reading/Reference Lists            | <ol style="list-style-type: none"> <li>1. G.S. Maddala (1977): Introduction to Econometrics, Mac Graw Hill.</li> <li>2. D.N. Gujarati (1995) : Basic Econometrics , Mac Graw Hill International editions.</li> <li>3. J. Johnston and J. Dinardo (1997) : Econometric Methods , 4<sup>th</sup> Edn, Mac Graw Hill.</li> </ol>   |   |
| Evaluation                         | <p style="text-align: center;"><b>Theory</b></p> CIA: 10<br>End-Sem: 50<br>Total: 60  | <p style="text-align: center;"><b>Practical</b></p> Continuous assessment: 40 |
| Paper Structure for End Sem Theory | Short questions (5 marks each)  | Long questions (15 marks each)  |
|                                    | 4 out of 6  | 2 out of 3  |