

<b>Course title: Advanced Statistical Methods for Management</b>				
<b>Course code: PPM 149</b>	<b>No. of credits: 2</b>	<b>L-T-P: 20-10-00</b>	<b>Learning hours: 30</b>	
<b>Pre-requisite course code and title (if any):</b> Basic understanding of statistics				
<b>Department:</b> Department of Business & Sustainability				
<b>Course coordinator:</b>		<b>Course instructor:</b>		
<b>Contact details:</b>				
<b>Course type: Core</b>		<b>Course offered in: Semester II</b>		
<b>Course description:</b>				
<p>In recent decades, econometric methods are widely applied to understand simple trends of a variable to complicated relationships among multiple variables. Econometrics as a subject has gone beyond its outlook as a method to make use of data, generate statistical inferences through modeling to address practical economic problems to solving complicated managerial problems. The course objective is to provide students an understanding of quantitative techniques in econometrics and an overview on time-series forecasting. This course will equip them to understand and evaluate most applied analysis using cross-sectional data. Since finance as a discipline has grown rapidly, introductory financial econometrics will also be dealt with suitable examples. There will be a strong emphasis on applied work, exploiting the availability of computer technique(s) for model solution.</p> <p>The prerequisite for studying this subject is a background in mathematics and elementary statistical theory. The mathematics requirement is a basic understanding of multivariate differential calculus. With regard to statistics, a clear understanding of sampling distribution of an estimator, and of the principles of statistical inference and hypothesis testing is necessary. The students are therefore advised to revise statistics and mathematics lectures in the first semester.</p>				
<b>Course objectives:</b>				
The specific objectives of the Econometrics module are the following:				
<ul style="list-style-type: none"> <li>▪ Illustrate use of econometrics in estimating models derived from theory</li> <li>▪ Demonstrate the practical use of econometric methods with reference to specific issues of applied economic interest</li> <li>▪ Inform interpretation and critical appraisal of model estimates</li> </ul>				
<b>Course contents</b>				
<b>Module</b>	<b>Topic</b>	<b>L</b>	<b>T</b>	<b>P</b>
1	<b>Simple and Multiple Regression Analysis: Assumptions and Asymptotic Properties</b> Introduction to econometrics, OLS & MLE, simple linear regression, deterministic & statistical model, sources of error, assumptions of OLS, method of OLS, properties of least-square estimators, multiple regression analysis, goodness of fit, adjusted R-square	4	1	0
2	<b>Dummy Variables</b> What is dummy variable, importance of dummy variable model and its application, slope, intercept and interaction dummy, dummy dependent variable	2	2	0
3	<b>Heteroscedasticity and Autocorrelation</b> Problem of heteroskedasticity, sources, consequences. Detection and solution of heteroskedasticity problem Problem of autocorrelation, sources, consequences. Detection and solution of autocorrelation problem	4	1	0
4	<b>Distributed Lag Models</b> Introduction to distributed lag model, reasons for lag, geometric & polynomial, Koyck method, Adaptive expectations model	2	1	0
5	<b>Time Series Properties</b> Introduction to time series data, concept of stationarity, stochastic process, stationary stochastic process Random walk model – with and without drift, MA, AR, ARMA & ARIMA model	3	2	0
6	<b>Forecasting</b> What is forecasting, methods and principles in forecasting, forecasting cycles, forecasting with regression	2	1	0
7	<b>Panel Data Models</b> Introduction to panel and pooled cross section data, advantages of panel data, CCM, Fixed and random effect model, Hausman test, introduction to impact analysis	3	2	0

	<b>Total</b>	<b>20</b>	<b>10</b>	<b>0</b>
<b>Evaluation criteria:</b>				
The final grade is obtained by averaging all the tests/quizzes and assignments (40% of weight), assignment (10%) and the final exam (50% of weight).				
<ul style="list-style-type: none"> <li>▪ Test 1 &amp; 2: Written test (module 1 &amp; 2) 40%</li> <li>▪ Test 3: Assignment (module 5 &amp; 6) 10%</li> <li>▪ Test 4: Writtentest (all modules) 50%</li> </ul>				
<b>Learning outcomes:</b>				
At the end of the course, it is expected that students are able to -				
<ul style="list-style-type: none"> <li>• successfully carry out regression technique under various conditions using available data (all evaluations)</li> <li>• develop an understanding of underlying assumption/conditions of the various techniques of forecasting (all evaluations)</li> <li>• restructure/transform available data into suitable form to apply various statistical techniques (all evaluations).</li> </ul>				
<b>Pedagogical approach:</b>				
A combination of class-room interactions, tutorials, assignments and projects.				
<b>Materials:</b>				
<b>Suggested readings</b>				
<ol style="list-style-type: none"> <li>1. Wooldridge J. (2012) Introductory Econometrics: A Modern Approach, 3<sup>rd</sup> Edition, Cengage Learning, India.</li> <li>2. Dougherty C. (2011) Introduction to Econometrics, 4<sup>th</sup> Edition, Oxford University Press. UK.</li> <li>3. Maddala GS (1988) Introduction to Econometrics, 2<sup>nd</sup> Edition, McMillan, USA.</li> </ol>				
<b>Additional information (if any):NA</b>				
<b>Student responsibilities:</b>				
Attendance, feedback, discipline: as per university rules.				

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**Course reviewers:**

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