



# SYMBIOSIS COLLEGE OF ARTS & COMMERCE

An Autonomous College | Under Savitribai Phule Pune University

Reaccredited 'A+' with 3.51 CGPA For Third Cycle By NAAC | College with Potential for Excellence

COURSE TITLE	Statistical Techniques for Economics	
<p><b>Course Learning Outcomes:</b>  <b>On successful completion of the module students will be able to:</b></p> <ol style="list-style-type: none"> <li>1. To provide essential knowledge of the theory and key properties of probability and random variables, and the application of these concepts in practical situations.</li> <li>2. To facilitate an understanding of the main branches of basic statistical inference, and to develop the ability to use statistical techniques to analyze data and assess the accuracy of the resulting estimates and conclusions.</li> <li>3. To introduce the fundamental concepts of statistical modelling, particularly linear regression models. This course should be of value to those intending to study any course involving economic modelling or any further course in statistics.</li> </ol>		
<p><b>Gist of this course in maximum 3 to 4 lines</b></p>	<p>The course is based on statistics and its application to Economics that would enable students to comprehend statistical techniques that can be applied to various economic scenarios/problems to find solutions.</p>	
Unit	CONTENTS OF THE COURSE	No. of Lectures
<p><b>1.</b></p>	<p><b><u>1. Statistical Packages for Economic Research</u></b>            1.1 R studio and SPSS            1.2 creating new data file - opening a data file - insert rows and columns - editing data - saving data file - assigning variable names and value tables - importing data from word processor - Excel merging data file - adding cases and variables.</p>	<p><b>12</b></p>
<p><b>2.</b></p>	<p><b><u>2. Title of the Topic: Probability Theory and Distribution</u></b>            2.1 Concept of Probability – Various Types of Events: Classical and Empirical Definitions of Probability –            2.2 Laws of Addition and Multiplication of Probability (statements only) – Conditional Probability            2.3 Random variables (Discrete and Continuous)            2.4 Mathematical Expectations with theorems            2.5 Binomial, Poisson and Normal Distributions, definition, Properties (without proof), uses, and illustrations            2.6 Chebyshev’s inequality and Central Limit Theorem</p>	<p><b>14</b></p>
<p><b>3.</b></p>	<p><b><u>3. Theory of Estimation</u></b>            3.1 Theory of estimation;            3.2 Properties of estimators;            3.3 Methods of estimation: least square method, method of moments and maximum likelihood;            3.4 Tests of Significance: parametric and nonparametric methods.</p>	<p><b>14</b></p>

4.	<b>4. TESTING OF HYPOTHESES</b> 4.1 Basic concepts of hypotheses testing: type I and II errors, level, size and p-value of a test, power of a test, 4.2 Testing hypotheses about the mean and the variance of a normal population, ANOVA 4.3 Small sample distributions: $\chi^2$ , t and F distributions and examples of their applications.	14
5.	<b>5. ANALYSIS OF TIME SERIES</b> 5.1 Analysis of Time Series Data 5.2 Components of Time Series 5.3 Determination of Trend 5.4 Least Square Method	
	<b>Total Number of Lectures</b>	<b>60</b>
<b>Teaching Methodology:</b>	<b>1. Technology Enabled Learning</b> <b>2. Class Discussions</b> <b>3. Analytical Thinking</b>	
<b>Recommended Readings:</b> <ol style="list-style-type: none"> <li>Croxton Frederiel, Dudley J. Gowden and Sidny Klein: Applied General Statistics, New Delhi: Prentice Hall, 1975</li> <li>Blalock, Hubert M: Social Statistics, London: McGraw Hill, 1981.</li> <li>Griffiths, D., W, Douglas and K. Laurence Weldon (1998): Understanding Data: Principles &amp; Practice of Statistics, John Wiley and Sons</li> <li>Gupta S.P: Statistical Methods, New Delhi, Chand &amp; Co, 2005.</li> <li>Gupta C.B: An Introduction to Statistical Methods, New Delhi, Vikas Publishers, 2005.</li> <li>Gupta. S.C: Fundamentals of Statistics, Bombay, Himalaya Publishing House, 2000.</li> <li>Agarwal Y.P: Statistical Methods: Concepts, Applications and Computations, New Delhi: Sterling Publishers, 1988.</li> </ol> <b>Suggested Readings:</b> <ol style="list-style-type: none"> <li>Mansfield, Edwin: Statistical for Business and Economics, New York : Norton and Co, 1980.</li> <li>Philip Hans Franses (1998), Time Series Models for Business and Economic Forecasting, Cambridge University Press</li> <li>Walker H.M &amp; Lev J: Statistical Inference, New York: Holt, 1980.</li> <li>Edward A.L: Statistical Methods for the Behavioural Sciences, New York: Rinchart &amp; Co, 1954.</li> <li>Edward W Frees (2004), Longitudinal and Panel Data: Analysis and Applications in Social Sciences, Cambridge University Press.</li> <li>Garrett E: Statistical Methods for Research Worker, New York, Hafner Publishing &amp; Co, 1950.</li> <li>Grewal P.S: Methods of Statistical Analysis, New Delhi: Sterling Publishers, 1990.</li> </ol>		