	Symbiosis College of Arts and Commerce (An Autonomous College Affiliated to University of Pune)										
Subject code	Semester	I	II	III	IV	V	VI	M.A.	I	II	III	IV
Title of Subject (For Approval by BOS)	**STATISTICAL METHODS FOR ECONOMICS**											
Objectives	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. 2. To facilitate an understanding of the main branches of basic statistical inference, and to develop the ability to use statistical techniques to analyse data and assess the accuracy of the resulting estimates and conclusions. 3. To introduce the fundamental concepts of statistical modelling, particularly linear regression models. 4. This course should be of value to those intending to study any course involving economic modelling or any further course in statistics.											

Detailed syllabus

Unit	Contents of the syllabus	Number of hours
1	**1. PROBABILITY THEORY AND DISTRIBUTION** Contents : 1.1 Concept of Probability – Various Types of Events: Classical and Empirical Definitions of Probability – 1.2 Laws of Addition and Multiplication of Probability (statements only) – Conditional Probability 1.3 Random variables (Discrete and Continuous) 1.4 Mathematical Expectations with theorems 1.5 Binomial, Poisson and Normal Distributions, definition, Properties (without proof), uses, and illustrations 1.6 Chebyshev's inequality and Central Limit Theorem	14
2	**2. THEORY OF ESTIMATION** Contents : 2.1 Theory of estimation; 2.2 Properties of estimators; 2.3 Methods of estimation: least square method, method of moments and maximum likelihood; 2.4 Tests of Significance: parametric and nonparametric methods.	10
3	**3. TESTING OF HYPOTHESES** Contents : 3.1 Basic concepts of hypotheses testing: type I and II errors, level, size and p-value of a test, power of a test, 3.2 Testing hypotheses about the mean and the variance of a normal population.	14

	3.3 Small sample distributions: $\chi 2$, t and F distributions and examples of their applications.	
4	**4. ANALYSIS OF TIME SERIES** Contents : 4.1 Analysis of Panel Data and Time Series Data 4.2 Components of Time Series 4.3 Determination of Trend 4.4 Least Square Method.	10
5	**5. STATISTICAL PACKAGES FOR ECONOMIC RESEARCH** Contents : 5.1 SPSS, E-Views, & R 5.2 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	12
	Total Numberof hours	60

Suggested Reference Books
1. Agarwal Y.P: Statistical Methods: Concepts, Applications and Computations, New Delhi: Sterling Publishers, 1988.
2. Blalock, Hubert M: Social Statistics, London: McGraw Hill, 1981.
3. Croxton Frederiel, Dudley J. Gowden and Sidny Klein: Applied General Statistics, New Delhi: Prentice Hall, 1975
4. Edward A.L: Statistical Methods for the Behavioural Sciences, New York: Rinchart & Co, 1954.
5. Edward W Frees (2004), Longitudinal and Panel Data: Analysis and Applications in Social Sciences, Cambridge University Press.
6. Garrett E: Statistical Methods for Research Worker, New York, Hafner Publishing & Co, 1950.
7. Grewal P.S: Methods of Statistical Analysis, New Delhi: Sterling Publishers, 1990.
8. Griffiths, D., W,. Douglas and K. Laurence Weldon (1998): Understanding Data: Principles & Practice of Statistics, John Wiley and Sons
9. Gupta S.P: Statistical Methods, New Delhi, Chand & Co, 2005.
10. Gupta C.B: An Introduction to Statistical Methods, New Delhi, Vikas Publishers, 2005.
11. Gupta. S.C: Fundamentals of Statistics, Bombay, Himalaya Publishing House, 2000.
12. Mansfield, Edwin: Statistical for Business and Economics, New York : Norton and Co, 1980.
13. Philip Hans Franses (1998), Time Series Models for Business and Economic Forecasting, Cambridge University Press
14. Walker H.M & Lev J: Statistical Inference, New York: Holt, 1980.