

As Per NEP 2020

University of Mumbai



Syllabus for Basket of SEC/VSC for Commerce Faculty	
Board of Studies in Mathematics	
UG First Year Programme	
Semester	II
Title of Paper	Credits
I) Practical Statistics for Commerce II (SEC/VSC)	2
From the Academic Year	2024-25

Name of the Course: Practical Statistics for Commerce – II

Sr. No.	Heading	Particulars
1	Description the course: Including but not limited to:	This course provides students with a strong foundation in statistical analysis techniques essential for understanding relationships between variables, analyzing time series data, and interpreting index numbers. This course covers fundamental concepts and techniques in statistical analysis, focusing on correlation, regression, time series analysis, and index numbers, enabling them to make informed decisions in various fields such as economics, finance, and social sciences.
2	Vertical:	SEC/VSC
3	Type:	Practical
4	Credits:	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	Hours Allotted:	60 Hours
6	Marks Allotted:	50 Marks
7	Course Objectives (CO): This course provides students with foundational statistical analysis techniques crucial for understanding variable relationships, analyzing time series data, and interpreting index numbers. Through practical applications, students will develop proficiency in correlation, regression, time series analysis, and index number calculation. CO1: To understand the scattered nature of data and the concept of fitting a straight line or curve to the data using the Method of Least Squares. CO2: To comprehend the concept of correlation, Karl Pearson's Coefficient of Correlation, and to explore Spearman's Rank Correlation Coefficient for qualitative data. CO3: To grasp the concept of regression, including obtaining regression lines and deriving mean and correlation coefficient from regression lines. CO4: To learn about time series analysis, including the components of time series, methods for trend estimation. CO5: To understand the concept and applications of index numbers and real income.	
8	Course Outcomes (OC): After completion of the course, students will be able to OC1: calculate cost of living index numbers and real income, thereby understanding their practical implications in economic analysis and policy-making. OC2: understand the relationship between variables through correlation analysis	

	and also, to explore the significance of index numbers related to economics and other fields. OC3: analyze scattered data and fit appropriate models using the Method of Least Squares. OC4: develop skills in time series analysis, including trend estimation and forecasting techniques. OC5: perform regression analysis effectively, including deriving regression lines and interpreting regression outputs.
9	Modules:- Module 1: Correlation and Regression 1. Understanding the scattered nature of the data. Concept of fitting a straight line or a curve (of higher degree) to the data. Method of Least Squares (Only the idea is to be imparted. The proof etc is not expected). Fitting a straight line using the method of least squares • Practical based on Plotting scatter diagram of the data • Practical based on fitting a straight line to the data 2. Bivariate Distribution. The concept of Correlation. Karl Pearson's Coefficient of Correlation. Correlation does not imply Causation. Qualitative data and Spearman's Rank Correlation Coefficient • Practical based on Identifying Univariate and Bivariate data • Practical based on finding Karl Pearson's Coefficient of Correlation • Practical based on Correlation versus Causation • Practical based on obtaining Spearman's Rank Correlation Coefficient 3. Concept of Regression. Obtaining regression lines of both types (y on x and x on y), Obtaining mean and correlation coefficient from regression lines • Practical based on finding regression line from the data • Practical based on Finding the point of intersection of the regression lines and verifying that it gives means of x and y • Practical based on identifying the type (x on y or y on x) regression lines and estimating the values of y for different values of x, or estimating values of x for different values of y Students are encouraged to use excel to solve practical problems. Module 2: Time Series and Index Numbers 1. Concept and Components of time series. Estimation of Trend using Moving Average Method & Least Squares Method (only Linear Trend) • Practical based on Estimation of trend using moving average method 2. Concept of Forecasting using Least Squares Method. • Practical based on forecasting y value for a given value of x • Practical based on forecasting x value for a given value of y 3. Concept and uses of Index Numbers. Simple and Composite Index Nos. (unweighted, weighted) • Practical based on Simple and Composite Index numbers 4. Laspeyre's Price Index No., Paasche's Price Index No. Fisher's Price Index No., Dorbish-Bowley's Index Number, Marshall and Edgeworth Index Number • Practical based on Laspeyre's Index Number

	• Practical based on Paasche's Index Number • Practical based on Fisher's Index Number • Practical based on Dorbish-Bowley's Index Number • Practical based on Marshall and Edgeworth Index Number 5. Cost of Living Index No., Real Income • Practical based on Cost of Living Index Number • Practical based on Real Income Students are encouraged to use excel to solve practical problems.							
10	Text Books 1. Fundamentals of Mathematical Statistics, 12th Edition, S. C. Gupta and V. K. Kapoor, Sultan Chand & Sons, 2020. 2. Statistics for Business and Economics, 11th Edition, David R. Anderson, Dennis J. Sweeney and Thomas A. Williams, Cengage Learning, 2011. 3. Introductory Statistics, 8th Edition, Prem S. Mann, John Wiley & Sons Inc., 2013.							
11	Reference Books 1. A First Course in Statistics, 12th Edition, James McClave and Terry Sincich, Pearson Education Limited, 2018. 2. Introductory Statistics, Barbara Illowsky, Susan Dean and Laurel Chiappetta, OpenStax, 2013.							
	<u>Scheme of the Examination</u>							
	The performance of the learners shall be evaluated into two parts. • Internal Continuous Assessment of 20 marks for each paper. • Semester End Examination of 30 marks for each paper. • Separate head of passing is required for internal and semester end examination.							
12	Internal Continuous Assessment: 40% Semester End Examination: 60%							
13	Continuous Evaluation through: Quizzes, Class Tests, presentation, project, role play, creative writing, assignment etc. (at least 3) Mid semester practical examination of 20 marks will be conducted on covered syllabus (at least 50% of total syllabus) of one hour duration as per the following pattern. <table border="1"> <thead> <tr> <th>Sr. No.</th><th>Title</th><th>Marks</th></tr> </thead> <tbody> <tr> <td>1.</td><td>Quiz comprising of MCQs (Attempt any 5 out of 8)</td><td>05</td></tr> </tbody> </table>		Sr. No.	Title	Marks	1.	Quiz comprising of MCQs (Attempt any 5 out of 8)	05
Sr. No.	Title	Marks						
1.	Quiz comprising of MCQs (Attempt any 5 out of 8)	05						

		(Online/Offline)											
	2.	Class Test comprising of Problems/ Programs (Attempt any 2 out of 4)	10										
	3.	Viva	05										
14	Format of Question Paper: The performance of the learners shall be evaluated into two parts. • Internal Continuous Assessment of 20 marks. • Semester End Examination of 30 marks. • Separate head of passing is required for internal, and semester end practical examination. Semester End Practical Examination (30 marks): Semester end practical examination of 30 marks on entire syllabus will be conducted of three hours duration as per the following pattern. <table><tr><th>Sr. No.</th><th>Title</th><th>Marks</th></tr><tr><td>1.</td><td>Problems/ Programs (Attempt any 5 out of 8)</td><td>25 Marks</td></tr><tr><td>2.</td><td>Journal</td><td>05 Marks</td></tr></table> The students are required to perform 75% of the Practical for the journal to be duly certified. The students are required to present a duly certified journal for appearing at the practical examination, failing which they will not be allowed to appear for the examination.				Sr. No.	Title	Marks	1.	Problems/ Programs (Attempt any 5 out of 8)	25 Marks	2.	Journal	05 Marks
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1.	Problems/ Programs (Attempt any 5 out of 8)	25 Marks											
2.	Journal	05 Marks											

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Chairman**

**Dr. Bhausaheb S Desale
The Chairman, Board of
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Dr. Madhav R. Rajwade
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