AC – 20/04/2024
Item No. – 6.7 Sem. II (7a)

As Per NEP 2020

University of Mumbai

Syllabus for
Basket of Minor

Board of Studies in Statistics	
UG First Year Programme	
Semester - II	
Title of Paper	**Credits 2/ 4**
I) Elementary Statistics-II	**2 credit**
II)	
III)	
From the Academic Year	**2024-25**

Name of the course: Elementary Statistics-II

Sr. No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to :**	Introduction: Elementary statistics-II course is focuses on to find relation between continuous variables and make prediction on the basis of explanatory variables. Student will learn correlation statistical methods for future prediction. This course will be helpful to all the faculties. This course will be useful for science, humanity and commerce faculty also. This course will be applicable to various field to analyze their basic data structure. This course is focuses practical as well as theoretical aspects of basic statistics correlation methods along with subjects from psychology, Economics, sociology, commerce , Computers , Mathematics , IT etc. There is growing demand for highly skilled statisticians in the 21st century in many fields including government, banking sector, health sciences, veterinary sciences, agricultural sciences, business, and social sciences etc
2	**Vertical :**	Minor
3	**Type :**	Theory
4	**Credit**:	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks

7	**Course Objectives**: Students will be able to, 1. Understand the concept of correlation and regression. 2. Compute the correlation of bivariate data. 3. Interpret the relationship between two numeric variables. **4.** Build a Simple Linear regression model to predict the response variable. **5.** Analysis and interpretation of daily household and business-related data using tools like index numbers
8	**Course Outcomes**: **on successful completion of the course Students Should be able to,** 1. To choose appropriate correlation method to data and interpret correlation between two variables using scatter diagram, Karl Pearson's Product moment correlation coefficient, Spearman's Rank correlation coefficient. 2. To obtain regression coefficient using least square method of estimation and apply method to real life problem. 3. Understand Nature of time series data and solve real life problems using freehand curve method, semi average method, moving average method, least square method, etc

9	**Modules**:-	**Lectures**
	Module 1: Correlation and Regression Analysis	
	• Scatter Diagram, product moment correlation coefficient and itsproperties. Spearman's Rank correlation (With and without ties) • Concept of linear regression, principle of least squares, fitting a straight line by method of least squares. Derivation for acute angle between the two lines of regression. • Relation between regression coefficients and correlation coefficient. • Fitting of curves reducible to linear form by transformation. Concept anduse of coefficient of determination (R^2). • Fitting a quadratic curve by method of least squares.	10
	Module 2: Time Series Analysis.	**10**

	• Definition of time series and its components. Models of time series. Estimation of trend by: i) Free hand curve method ii) Method of semi average iii) Method of Moving average iv) Method of least squares (linear trendonly) • Estimation of seasonal component by i) method of simple average • ii) Ratio to moving average iii) Ratio to trend method.	
	Module 3: Index Numbers.	**10**
	• Index numbers as comparative tool. Stages in the construction of Price Index Numbers. • Measures of Simple and Composite Index Numbers. Laspeyre's, Paasche's, Marshal-Edgeworth's, Dobisch & Bowley's and Fisher's Index Numbers . • Quantity Index Numbers and Value Index Numbers, Time rever saltest, Factor reversal test, Circular test. • Fixed base Index Numbers, Chain base Index Numbers. Base shifting, splicing and deflating. • Cost of Living Index Number. Concept of Real Income based on WholesalePrice Index Number.	

11	**Reference Books:** 1. Agarwal B. L, Basic Statistics, New Age International P Ltd. Delhi, 2015 2. Saxena S., Kapoor J. N., Mathematical Statistics, Sultan Chand & Sons, Delhi, 2010 3. Gupta S. P, Statistical Methods, Sultan Chand and Sons, New Delhi, 2002 4. Gupta S. C and Kapoor V. K Fundamental of Mathematical Statistics, S Chand & Sons, Delhi, 2008 5. Grewal P. S. Methods of Statistical Analysis, Sterling Publishers, 1990 6. Mukhopadyay P., An Introduction to the theory of Probability, World Scientific Publishing Company,2011 7. S.C. Gupta and V.K. Kapoor, Applied Statistics, Sultan Chand and sons.

Format of Question Paper:

Internal Continuous Assessment: (20 marks)

Assignment/viva	Class Test	Total
Quizzes, Class Tests, presentation, project, role play,		

creative writing, assignment etc.(at least 3)		
05	15	20

Semester End Examination: (30 marks)

Semester End Examination will be of 30 marks of 01 hour duration covering entire syllabus of the semester. All questions are Compulsory.

Theory Question Paper Pattern:

Q 1	Attempt any one question out of two questions (Module I and II)	Max. marks: 10
Q 2	Attempt any two questions out of three questions (Module I)	Max. marks: 10
Q 3	Attempt any two questions out of three questions (Module II)	Max. marks: 10

Sign of the BOS Chairman
Dr. Santosh Gite
Board of Studies in Statistics

Sign of the Offg. Associate Dean
Dr. Madhav R. Rajwade
Faculty of Science & Technology

Sign of the Offg. Dean
Prof. Shivram S. Garje
Faculty of Science & Technology