Progressive Education Society's
Modern College of Arts, Science and Commerce,
Shivajinagar, Pune – 05
NEP 2024
Course under NEP 2020 (OE)

Course Code: 24ScStaU4401
Course Name: Applied Statistics – II
Teaching Scheme: 2 hours/week **Credits: 2**
Examination Scheme: CIA: 20 Marks **End Sem: 30 Marks**

Prerequisite Courses:

- Basic understanding of statistics and probability theory.

Course Objectives:

- To introduce statistical distributions like exponential and normal distributions and their applications.
- To develop skills in analysing time series data, identifying trends, and estimating seasonality.
- To provide an understanding of vital statistics and demographic measures used in public health and policy-making.
- To apply statistical methods to interpret and analyse real-world demographic and economic data.

Course Outcomes:
At the end of this course students will be able to:

1. Understand Time Series Components. Interpret of Time Series Patterns:
2. Study methods of Time Series, Apply Time Series Analysis:
3. Understand Queuing Model Concepts, Probability Distribution and Queuing Parameters.
4. Interpret and analyze Queuing Metrics.
5. Understand Vital Events and Statistics:
6. Analyze Trends in Vital Rates, Interpret Vital Rates.

Course Contents:

Unit1	**Exponential and Normal distribution**	**8 Lectures**
	1.1 Introduction of exponential distribution, only Statement of mean and variance, lack of memory property, Applications of exponential distribution. 1.2 Introduction of normal distribution, only Statement of mean and variance, Applications of normal distribution.	
Unit 2	**Time Series**	**10 Lectures**
	2.1 Meaning and Utility. 2.2 Components of Time Series. 2.3 Additive and Multiplicative models. 2.4 Methods of estimating trend: moving Average method	

Unit 3	Vital Statistics	12 Lectures
	3.1 Vital events, vital statistics, methods of obtaining vital statistics, rates of vital events, sex ratios, dependency ratio. 3.2 Death/Mortality rates: Crude death rate, specific (age, sex etc.) death rate, standardized death rate (direct and indirect), infant mortality rate. 3.3 Fertility/Birth rate: Crude birth rate, general fertility rate, specific (age, sex etc.) fertility rates, total fertility rate. 3.4 Growth/Reproduction rates Gross reproduction rate, net reproduction rate. 3.5 Interpretations of different rates, uses and applications.	

References:	
1	Fundamentals of Mathematical Statistics, by Gupta and Kapoor, Sultan Chand and Sons, New Delhi.
2	Fundamentals of Applied Statistics, by Gupta and Kapoor, Sultan Chand and Sons, NewDelhi.