

UNIVERSITY OF DELHI

CNC-II/093/1(40)/EC-1270/2024-25/156

Dated: 07.08.2024

NOTIFICATION

Sub: Amendment to Ordinance V

Following addition be made to Appendix-II-A to the Ordinance V (2-A) of the Ordinances of the University;

Add the following:

In pursuant of EC Resolution No. 5-13/ dated 27.07.2024, the following amendment is made based on Undergraduate Curriculum Framework 2022 implemented from the Academic Session 2022-2023:

- (i) Addition of a paper titled "Introduction to Vital Statistics and Demography" for students of BSc (Programme) Mathematical Sciences under the Pool of DSEs in Semester-IV (Note: The paper is already running as a DSC paper of BA Prog. (Major) in Sem-IV). – **Annexure-1.**
- (ii) Deletion of a Generic Elective paper titled "Introduction to Statistics" in Semester-1.
- (iii) Revision of Generic Elective paper titled "Basic Statistics" in Semester-1 - **Annexure-2.**
- (iv) Correction in the name/title of following papers:

Existing	Proposed
BSc (Hons.) –DSC4 Theory of Probability Distribution	BSc (Hons.) –DSC4 Theory of Probability Distributions
BSc (Hons.) –DSC50 Applied Statistics-I	BSc (Hons.) –DSC5 Applied Statistics
BA Prog./ BSc (Prog.) Mathematical Sciences- DSC3 Sampling Distributions	BA Prog./ BSc (Prog.) Mathematical Sciences- DSC3 Elements of Sampling Distributions
BA Prog./ BSc (Prog.) Mathematical Sciences- DSC4 Elements of Statistics Inference	BA Prog./ BSc (Prog.) Mathematical Sciences- DSC4 Basics of Statistical Inference
BSc. (Prog.) Mathematical Sciences-DSE-1 Index numbers and Time Series Analysis	BSc. (Prog.) Mathematical Sciences-DSE-1 Time Series Analysis and Index numbers
BSc (Hons.) - DSE – Semester-6 Statistical Computing and Data Mining	BSc (Hons.) - DSE – Semester-6 Statistical Computing and Basic Data Mining
BA (Prog.) - DSC-6 – Semester-6 Statistical Methods in Psychology and Education	BA (Prog.) - DSC-6 – Semester-6 Statistical Methods for Psychology and Education

Nabeela
Registrar

REGISTRAR

With effect from academic session 2024-2025

DISCIPLINE SPECIFIC ELECTIVE COURSE DSE -2: INTRODUCTION TO VITAL STATISTICS AND DEMOGRAPHY

CREDIT DISTRIBUTION, ELIGIBILITY, AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the Course			Eligibility Criteria	Pre-requisite of the Course (if any)
		Lecture	Tutorial	Practical/ Practice		
Introduction to Vital Statistics and Demography	4	3	0	1	Class XII with Mathematics	knowledge of basic statistics

Learning Objectives:

The learning objectives of this course are as follows:

- To collect valid Demographic data using different methods.
- To learn basic measures of Mortality, Fertility, and Population Growth.
- To construct life tables.

Learning Outcomes:

After successful completion of this course, students will be able to:

- Distinguish between Vital Statistics and Demography.
- Understand errors in Demographic data.
- Comprehend sources of data collection on Vital Statistics and errors therein.
- Use methods for measurement of Population.
- Distinguish between Rate and Ratio.
- Understand the basic measures of Mortality.
- Describe and apply the concepts of Stable and Stationary Populations.
- Understand the concept of Life Tables and their construction.
- Understand the basic measures of Fertility.
- Apply measures of Population Growth.

SYLLABUS OF DSC-8

Theory

UNIT I (10 Hours)

Introduction to Vital Statistics

Introduction and sources of collecting data on vital statistics, errors in the census, and registration data. Measurement of population, rate, and the ratio of vital events.

UNIT II (12 Hours)

Measurements of Mortality

Crude Death Rate (CDR), Specific Death Rate (SDR), Infant Mortality Rate (IMR), and Standardized Death Rates. Stationary and Stable population, Central Mortality Rates, and Force of Mortality.

UNIT III (10 Hours)

Life Tables

Life(Mortality) Tables: Assumption, description, construction of Life Tables, and Uses of Life Tables.

UNIT IV (13 Hours)

Measurements of Fertility

Crude Birth Rate (CBR), General Fertility Rate (GFR), Specific Fertility Rate (SFR), and Total Fertility Rate (TFR). Measurement of Population Growth: Crude rates of natural increase, Pearl's Vital Index, Gross Reproduction Rate (GRR), and Net Reproduction Rate (NRR).

PRACTICAL/LAB WORK - 30 hours

List of Practicals:

1. To calculate CDR and Age Specific death rate for a given set of data.
2. To find a standardized death rate by (i) Direct method and (ii) Indirect method.
3. To construct a complete life table.
4. To fill in the missing entries in a life table.
5. To calculate CBR, GFR, SFR, TFR for a given set of data.
6. To calculate Crude rate of Natural Increase and Pearle's Vital Index for a given set of data.
7. Calculate GRR and NRR for a given set of data and compare them.

Practical work to be conducted using electronic spreadsheet / EXCEL/ Statistical Software Package/ SPSS/ calculators.

ESSENTIAL READINGS:

- Gun, A.M., Gupta, M.K. and Dasgupta, B. (2008). Fundamentals of Statistics, Vol. II, 9thEd., World Press.
- Biswas, S. (1988). Stochastic Processes in Demography & Application, Wiley Eastern Ltd.

SUGGESTED READING:

- Mukhopadhyay, P. (1999). Applied Statistics, Books and Allied (P) Ltd.

- Keyfitz, N. and Beekman, J.A. (1985). Demography through Problems. S-Verlag, New York.
- Croxton, Fredrick, E. Cowden, Dudley J. and Klein, S. (1973). Applied General Statistics, 3rd Ed., Prentice Hall of India Pvt. Ltd.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch University of Delhi, from time to time.

DEPARTMENT OF STATISTICS

**COMMON POOL OF GENERIC ELECTIVES (GE) COURSES
OFFERED BY DEPARTMENT OF STATISTICS
CATEGORY-IV, SEMESTER-I**

With effect from academic session 2024-2025

GENERIC ELECTIVES- 1A: BASIC STATISTICS

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE
COURSE**

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
Basic Statistics	4	3	0	1	Class XII pass with Mathematics	NIL	Statistics

Learning Objectives

The Learning Objectives of this course are as follows:

- Acquainting the students with descriptive data analysis.
- To introduce students to different measurement scales, qualitative and quantitative and discrete and continuous data.
- To help students to organise data into frequency distribution graphs, including bar graphs, histograms, polygons and ogives.
- Students should be able to understand the purpose for measuring central tendency, dispersion, skewness and kurtosis and should be able to compute them as well.
- Students should be able to understand theory of attributes, independence and association of attributes.

Learning outcomes

After completion of this course, the students will be able to:

- Apply the concepts of statistical population and sample, variables and attributes.
- Present tabular and graphical representation of data based on variables.
- Measures of central tendency, Dispersion, Skewness and Kurtosis.
- Employ moments and their use in studying various characteristics of data.

- Employ correlation and regression analysis of bivariate data.
- Understand theory of attributes.

SYLLABUS OF GE -1a

Theory

Unit - 1 (10 hours)

Elementary Statistics

Concepts of a statistical population and sample from a population, quantitative and qualitative data, nominal, ordinal and time-series data, discrete and continuous data. Presentation of data by tables and by diagrams, frequency distributions for discrete and continuous data, graphical representation of a frequency distribution by histogram and frequency polygon, cumulative frequency distributions (inclusive and exclusive methods).

Unit – 2 (18 hours)

Descriptive Statistics

Measures of Central Tendency: Arithmetic mean, median, mode, geometric mean, harmonic mean, partition values. Measures of Dispersion: Range, quartile deviation, mean deviation, standard deviation, variance, coefficient of dispersion: coefficient of variation. Moments, Measure of skewness and kurtosis.

Unit – 3 (07 hours)

Theory of Attributes

Theory of Attributes: Consistency of data, independence of attributes, association of attributes, Yule's coefficient of association, coefficient of colligation.

Unit - 4 (10 hours)

Correlation and Regression

Bivariate data: Definition, scatter diagram, simple, partial and multiple correlation (3 variables only), rank correlation. Simple linear regression, principle of least squares and fitting of polynomials and exponential curves.

Practical – 30 Hours

List of Practicals:

1. Problems based on graphical representation of data.
2. Problems based on measures of central tendency using raw data, grouped data and for change of origin and scale.
3. Problems based on measures of dispersion using raw data, grouped data and for change of origin and scale.
4. Problems based on combined mean and variance and coefficient of variation.

5. Problems based on Moments using raw data, grouped data and for change of origin and scale.
6. Problems based on relationships between moments about origin and central moments.
7. Problems based on Skewness and kurtosis.
8. Problems based on Karl Pearson correlation coefficient (with/without change of scale and origin).
9. Problems based on Lines of regression, angle between two lines of regression
10. Problems based on Spearman rank correlation.
11. Fitting of polynomials and exponential curves.
12. Checking consistency of data.
13. Checking the independence of attributes
14. Measuring the association between the attributes

Essential Readings

- Goon, A. M., Gupta, M. K. and Dasgupta, B. (2003). An Outline of Statistical Theory (4th ed., Vol. I). World Press, Kolkata.
- Gupta, S. C. and Kapoor, V. K. (2021). Fundamentals of Mathematical Statistics (60th ed.). Sultan Chand and Sons.
- Hogg, R. V., Craig, A. T. and McKean, J. W. (2005). Introduction to Mathematical Statistics (6th ed.). Pearson Education.
- Mood, A.M. Graybill, F.A. and Boes, D.C. (2007). Introduction to the Theory of Statistics, 3rd Ed., (Reprint), Tata McGraw-Hill Pub. Co. Ltd.

Suggestive Reading

- Miller, I. and Miller, M. (2006). John E. Freund's Mathematical Statistics with Applications, 7th Ed., Pearson Education, Asia

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