

- Cochran, W.G. (2011): Sampling Techniques (3rd Ed.), Wiley Eastern John Wiley and Sons..
- Sukhatme, P. V., Sukhatme, B. V., Sukhatme, S., Asok, C.(1984). Sampling Theories of Survey with Application, IOWA State University Press and Indian Society of Agricultural Statistics.
- Gupta, S.C. and Kapoor, V.K. (2007): Fundamentals of Applied Statistics, Sultan Chand and Sons.
- Singh, D. and Chaudhary, F. S. (2015): Theory and Analysis of Sample Survey Designs.

SUGGESTED READING:

- Murthy M.N. (1977): Sampling Theory & Statistical Methods, Statistical Pub. Society, Calcutta.
- Des Raj and Chandhok P. (1998): Sample Survey Theory, Narosa Publishing House.
- Goon, A. M., Gupta, M. K. and Dasgupta, B. (2001): Fundamentals of Statistics (Vol.2), World Press.

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DISCIPLINE SPECIFIC ELECTIVE-2C: DEMOGRAPHY (Not for category II)

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

| Course title and code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course (if any) |
|-----------------------|---------|-----------------------------------|-----------|--------------------|----------------------------|--------------------------------------|
| | | Lectures | Tutorials | Practical/Practice | | |
| 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 introduce various demographic concepts and to explain the nature and scope of population studies.
- To explain evaluation and adjustments in age data using different indices.
- To introduce the construction of abridged life tables and the estimation and projection of population by different methods.
- To describe the Graduation of mortality rates by different methods.

Learning Outcomes:

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

- Understand the various components of Demography, sources of demographic data collection and errors therein.
- Comprehend population potential, density and concentration.
- Analyse the completeness of registration data using the Chandrasekharan-Deming formula.
- Use concepts of Stable and Stationary Populations.
- Use Balancing Equations.

- Use Myer's and UN indices in evaluating age data.
- Apply measures of the aging of population.
- Understand the concept of Abridged life tables and their construction by Reed and Merrell method and Greville's method.
- Synthesize population estimation and projection by different methods.
- Use Graduation of mortality rates by Makeham's and Gompertz graduation formula.
- Fit of Logistic curve and Makeham's formula.
- Understand the scope of population studies and its relationship with other disciplines.

SYLLABUS OF DSE-2C

Theory

UNIT I: (15 Hours)

Demographic concepts

Definition of demography and its various components, Major sources of demographic data collection and errors therein; Coverage and content errors, Rate of population change, Population density, Population potential, Population composition, Scale of urbanization and scale of population concentration, Concept of Stationary and stable populations, Nature and scope of population studies and its relationship with other disciplines. Balancing equations and its uses.

UNIT II: (15 Hours)

Adjustment of demographic data and abridged life tables

Measures of aging of population: Aged-child ratio, Old-age dependency ratio, Child dependency ratio, Age-dependency ratio, Adjustment of age data at younger age groups and adult ages. Chandrasekharan-Deming formula to check completeness of registration data. Myer's index, United Nation's index.

Abridged life tables: Concept and its construction by Reed-Merrell method and Greville's method.

UNIT III (15 Hours)

Population Estimates and Projections and Graduation of Mortality Rates:

Inter-censal and post-censal estimates by mathematical and component method ; Population Projection by the mathematical method: Logistic curve and its fitting by Pearl and Reed method and Rhodes method. Graduation of mortality rates: Makeham's and Gompertz graduation formula. Fitting of Makeham's formula.

PRACTICAL/LAB WORK - 30 hours

List of Practicals:

1. To find the Population density of a place.
2. To find Population Potential.
3. To find Rate of population change
4. To find Age Dependency ratio.
5. To find Aged Child ratio.
6. To find Child Dependency ratio.
7. To construct Abridged Life Table by Reed and Merrell method.
8. To Construct Abridged Life Table by Greville's method.

9. To fit Logistic curve by Pearl and Reed method.
10. To fit Logistic curve by Rhode's method.
11. To fit Makeham's formula by the method of Four Selected Points.
12. To fit Makeham's formula by the method of Partial Sums.

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, 9th Edition, World Press.
- Mukhopadhyay P. (1999): Applied Statistics, Books and Allied (P) Ltd.
- Biswas, S. (1988): Stochastic Processes in Demography & Application, Wiley Eastern Ltd.
- Pathak, K. B. and F. Ram (1998), *Techniques of Demographic Analysis*, 2nd Edition, Himalaya Publishing House, Bombay.

SUGGESTED READINGS:

- Croxton, Fredrick E., Cowden, Dudley J. and Klein, S. (1973): Applied General Statistics, 3rd Edition. Prentice Hall of India Pvt. Ltd.
- Keyfitz N., Beckman John A. (1985): Demography through Problems S-Verlag New York
- Ramakumar R. (1986): Technical Demography. Wiley Eastern Limited.

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