B. Sc. Part – I Semester – II
DSC-III
(STATISTICAL METHODS)
Theory: 30 hrs., Marks -50 (Credits: 02)

Course Outcomes: The students will acquire knowledge of
    i. the time series data and its analysis,
    ii. rates of vital events, its computation and interpretation,
    iii. how to compute and interpret index numbers,
    iv. cost of living index number and its utility,

Unit 1:   **(15 hrs.)**

1.1 Analysis of Time Series Data:
- Meaning and need of time series data analysis.
- Components of time series: (i) secular trend (ii) seasonal variations (iii) cyclical variations (iv) random or irregular variations.
- Additive model and multiplicative model.
- Utility of time series data analysis.
- Measurement of secular trend by using: (i) moving average method (ii) progressive average method (iii) least square method.
- Measurement of seasonal variations by simple average method.

1.2 Demography:
- Introduction and need of vital statistics;
- Vital events and rates of vital events,
- Measurement of fertility: Crude Birth Rate (CBR), Age Specific Fertility Rate (ASFR), General Fertility Rate (GFR) and Total Fertility Rate (TFR);
- Measurement of mortality: Crude death rate (CDR), Specific Death Rate (SDR), Age Specific Death Rate (ASDR), Infant Mortality Rate (IMR), Standardized Death Rate (STDR) by i) direct method ii) indirect method ;
- Measurement of Population Growth: Gross Reproduction Rate (GRR), Net Reproduction Rate (NRR), relation between GRR and TFR; Introduction to Life tables.

Unit 2   **(15 hrs.)**

2.1 Index Numbers:
- Meaning and utility of index numbers.
- Price, Quantity and Value index numbers.
- Problems in the construction of index numbers.
- Types of index numbers: Un-weighted and weighted index numbers.

- Methods of computing un-weighted index numbers: (a) Simple aggregate method and (b) Average of price or quantity relative method (using A.M. or G.M.).
- Methods of computing weighted index numbers: (a) Laspeyre's method (b) Paasche's method and (c) Fisher's method.

2.2 Tests of Index Numbers:

- Unit test, time reversal test and factor reversal tests.
- Cost of living index numbers, construction of cost of living index numbers by using (i) Family budget method and (ii) Aggregate expenditure method.
- Purchasing power of money; difference between money wages and real wages.
- Meaning and interpretation of BSE (Bombay Stock Exchange) and NSE (National Stock Exchange) indices.

Books Recommended:

1. Bhat B. R., Srivenkatramana T and Madhava Rao K. S. (1997): Statistics: a Beginner's Text, Vol. II, New Age International (P) Ltd.
2. Chatfield C. "The Analysis of Time Series –An Introduction", Chapman & Hall, 2004.
3. Croxton F. E., Cowden D.J. and Kelin S. (1973): Applied General Statistics, Prentice Hall of India.
4. Goon A. M., Gupta M. K., Das Gupta B. (1999): Fundamentals of Statistics, Vol.I and II, World Press, Calcutta.
5. Gupta S. P. (2002): Statistical Methods, Sultan Chand and Sons, New Delhi.
6. Gupta V.K. & Kapoor S.C. Fundamentals of Applied Statistics.- Sultan & Chand
7. Hoel P. G. (1971): Introduction to Mathematical Statistics, Asia Publishing House.
8. Kendall M.G. "Time Series", Charles Griffin, 1978.
9. Snedecor G.W. and Cochoran W. G. "Statistical Methods", Lowa State University Press.
10. Srivastav D. S: A Text book of Demography.
11. Waiker and Lev.: Elementary Statistical Methods.