Department of Statistics, Govt. Degree College Baramulla (Autonomous)

Syllabus for 5th Semester (Statistics) NEP Batch 2022 and onwards **Credit=4+2**
Paper-I (Major/Minor) **Title: Sampling Techniques-I** **Code: .....**

Course Objectives: To inculcate in students the understanding of sample surveys.
Course Outcome: On successful completion of this course the students will be able to

- Describe the various methods of sample selection.
- Apply the Sample Survey Techniques in real life problems.

THEORY (4 Credits)

UNIT-I Basic Concepts in Sampling **(16hrs)**

Concept of population and sample, Application of sampling techniques, Need for sampling, Census and Sample Survey, basic concept in Sampling, Principles of Sample Survey, Advantages of Sample Survey over Census, Sampling and non- Sampling errors, Types of Sampling (probability and non-probability, Sampling), Principle Steps in Sample Survey.

UNIT-II Simple Random Sampling (SRS) **(16hrs)**

Simple Random Sampling with and without replacement, Merits and Demerits of Simple Random Sampling (SRS), Methods of selecting SRS (lottery method and Random number table), Estimation of mean, its sampling variance and estimate of its variance , Unbiased estimate of population Mean Square.

UNIT-III Stratified Random Sampling **(16hrs)**

Introduction, Principle of Stratification, Advantages of stratification, Estimation of mean and variance, Advantages of Stratified Random Sampling over Simple Random Sampling, equal allocation, Proportional and Optimum allocation, Allocations of sample size under Proportional, Optimum allocation and variance under these allocations, Comparison of Stratified Random Sampling over Simple Random Sampling (for linear population).

UNIT-IV Systematic Sampling **(16hrs)**

Introduction, sample selection procedure (linear Systematic Samples and Circular Systematic Samples), advantages and disadvantages of Systematic Sampling, Estimation of mean and its sampling variance, Advantages of Systematic Sampling over SRS and Stratified Random Sampling, Comparison of Systematic Sampling over SRS and Stratified Random Sampling.

PRACTICAL (2 Credits)

Practical based on:

1. Selection of Sample by different methods.
2. Estimation of total, mean and its sampling variance under SRSWR and SRSWOR.
3. Estimation of mean and variance under stratified sampling.
4. Estimation of Variance under proportional allocation in stratified random sampling.
5. Estimation of Variance under optimum allocation in stratified random sampling.
6. Estimation of variance under equal allocation in stratified random sampling.
7. Estimation of mean and variance in systematic sampling.

REFERENCES:

1. Murthy M.N (1967): Sampling theory and methods, Statistical Publisher Society, Calcutta.
2. Des Raj (2000): Sample Survey Theory, Narosa Publishing house, New Delhi.
3. Sampath S. (2000): Sampling Theory and Methods, Narosa Publishing house, New Delhi.
4. Sukhatme B.V (1984): Sample Survey Methods and its Applications, Indian Society of Agricultural Statistics, New Delhi.
5. Cochran, W. G. (1977): Sampling techniques, third edition, Willy India Pvt. ltd.
6. Ranjan K.Son: Practical Sampling Techniques, second edition, revised & expanded,CRC Press.
7. Daraga Singh, F.S Chaudhary: Theory & Analysis of Sample Survey Designs, 2nd edition ,New Age International Publishers.
8. Parimal Muthopadhyay : Theory & ,Methods of Survey Sampling, PHI.
9. Arun Kumar, Alka Chaudry: Sample Survey, Analysis and Design of Experiments, Krishna. Prakashin Media pvt.ltd, Meerut Delhi.

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Syllabus for 5th Semester (Statistics) NEP Batch 2022 and onwards **Credit = 4+2**

Paper-II (Major) **Title: Design of Experiments-I** **Code: .....**

Course Objectives: To inculcate in students the understanding of Design of experiments.

Course Outcomes: On successful completion of this course the student will be able to comprehend:

- The basic concepts of ANOVA and analysis of one way and two way classifications.
- The basic concept of Design of Experiments, CRD, RBD, LSD and its applications in day to day life.

THEORY (4 CREDITS)

UNIT –I (ANOVA) Analysis of Variance **(16hrs)**

Introduction, Assumptions and Applications, ANOVA for one way and two way classification (using Principle of LSE). ANOVA table, its interpretation and related examples.

UNIT-II Basic Concepts in Design of Experiments & CRD. **(16hrs)**

Design of Experiments: Introduction, Terminology in experimental designs, Experimental Unit, Experimental Error, Treatments, Blocks, Replication, Precision, Contour Map, Yield, Uniformity Trials, Principles of Experimental Design (Randomization, Replication and Local Control). Completely Randomized Design (CRD): Introduction, layout, analysis, advantages and disadvantages.

UNIT-III Randomized Block Design (RBD). **(16hrs)**

Introduction, layout, analysis, advantages and disadvantages of RBD over CRD, efficiency of RBD relative to CRD, estimation of one missing values in CRD and RBD.

UNIT-IV Latin Square Design (LSD). **(16hrs)**

Introduction, layout, analysis of mxm LSD for one observation per experimental unit, advantages and disadvantages, Single missing observation analysis for LSD, Relative efficiency of LSD relative to RBD & CRD.

PRACTICAL (02 CREDITS)

Practical based on:

1. Analysis of variance in one-way classification.
2. Analysis of variance in two-way classification.
3. Analysis of CRD, RBD & LSD.
4. Analysis of missing observation in CRD
5. Analysis of missing observation in RBD.
6. Analysis of missing observation in LSD.

REFERENCES:

1. Goon A.M., Gupta M.K, Das Gupta B. (1986): Fundamentals of Statistics, Vol. II, World Press, Calcutta.
2. S.C. Gupta and V.K Kapoor: Fundamentals of Applied Statistics, S. Chand, New Delhi.
3. Cochran W.G and Cox G.M (1957): Experimental Designs, John Wiley and Sons.
4. Das, M.N. and N.G. Giri (1986): Design and Analysis of Experiments, (third edition) New Age International Publishers.
5. Gupta and Mukhopadhay P.P: Applied Statistics, Central Book Agency.
6. Kempthrone. O. (1965): The Design and Analysis of Experiments (volume- I) 2nd Edition, Willey.
7. Arun Kumar, Alka Chaudhary: Sample Survey, Analysis & Design of experiment, Krishna Prakashna Media, Pvt. Ltd, Meerut Delhi.

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Syllabus for 5th Semester (Statistics) NEP Batch 2022 and onwards **Credit=2**
Paper-III (Major) **Title: Internship-I** **Code:.....**

Course Objectives: To inculcate in students the understanding and the applications of various tools of Statistics in real life problems.

Course Outcome: On successful completion of this course the students will be able to:

- Use different Statistical tools for collection of data related to the problems undertaken for its presentation, analysis and interpretations
- Undertake different day to day life activities prevailing in the society for its critical analysis and drawing valid conclusions.

Internship (2 Credits)

Internship based upon the topics which have relevance in the practical applications to our day to day life problems.The student has to submit the detailed report to the concerned department.