

**PT. RAVISHANKAR SHUKLA UNIVERSITY, RAIPUR**  
**SCHOOL OF STUDIES IN STATISTICS**

**Syllabus for Ph. D. Course Work in Statistics, 2016-17**

The Ph.D. Course in Statistics shall be of six months.. This course shall have two papers.. Paper I is theory paper and Paper II is project course work. Each paper is of 100 marks .Theory paper will be of 3 hours duration. In paper II, 40% marks will be assigned to seminar which will be evaluated by departmental research committee and 60% marks will be assigned to project work which will be evaluated by external and internal examiner jointly.

<b>Scheme of Examination</b>	
Paper I : <b>Research Methodology , Quantitative Methods &amp; Computer Applications</b>	<b>:100 Marks</b>
Paper II : <b>Review of Literature concerning the topic of research and Seminar/Project report</b>  (a) Seminar (b) Project work and Viva Voce	<b>:100 Marks</b>  40 marks 60 marks
Total Marks	<b>200 Marks</b>

**Paper I**

**Research Methodology, Quantitative Methods & Computer applications.**

**Unit I:** Research methodology: An introduction, meaning of research ,objective of research, Research Methods versus Methodology, Selection of research problem, Necessity of defining the problem. Technique involved in Defining a problem. Methods of Data Collection: Collection of Primary data, construction of questionnaire, Collection of data through questionnaire, Difference between questionnaires and schedules, Some other methods of data collections, Collection of Secondary data, Processing and analysis of data. Use of Statistical package, SPSS for data analysis.

**Unit II:** A review of Simple Random Sampling, Estimation of population proportion, Stratified, Optimum Allocation, Practical difficulty in adopting Neyman Allocation, formation of strata. Systematic sampling. PPS sampling, Multistage sampling. Ratio and Regression methods of estimation in various sampling designs.

**Unit III:** The structure and formation of a linear programming problem, Graphical and simplex procedure, Two phase methods, and Charné's-M method with artificial variables ; duality theorem. Transportation and Assignment problems, Routing and traveling salesman problem. Inventory problems – Deterministic models of inventory , Economic Lot size formula ,instantaneous production case ,finite production rates situation ,cases when shortages are allowed /not allowed. Stochastic inventory models – a single period model with no set up cost.

#### **UNIT-IV**

Acceptance sampling plans for attribute inspection ; single, double and sequential sampling plans and their properties ; Bayesian sampling plan. Plans for inspection by variables for one-sided and two-sided specifications; Continuous sampling plans of Dodge type and Wald-Wolfowitz type and their properties

**UNIT-V:** Life distributions ; common life distributions-exponential, Weibull, gamma etc. Estimation of parameters and tests in these models. Notions of ageing ; IFR, IFRA, NBU, DMRL, and NBUE Classes and their duals ; loss of memory property of the exponential distribution ; closures of these classes under formation of coherent systems, convolutions and mixtures. Univariate shock models and life distributions arising out of them ; bivariate shock models ; common bivariate exponential distributions and their properties. Reliability estimation based on failure times in variously censored life tests and in tests with replacement of failed items.

#### **References:**

1. Freedman,P., "The Principles of Scientific Research, 2<sup>nd</sup> ed., new York Pergamon Press, 1960
2. Gaum, Carl G., Graves , Harold F., and Hoffman , Lyme, S.S., Report Writing , New York : Barnes & Noble , Inc, 1956.
3. Weller, S.; Romney, A., "Systematic Data Collection "(Qualitative Research Method Series 10)
4. C.R.Kothari, "Research Methodology", Second Edition, Wishwa Publication, Wiley Eastern Limited, New Delhi.
5. Mukhopadhyay, P. (1998): Theory and methods of Survey Sampling , Prentice-Hall of India Pvt. Ltd. New Delhi.
6. Sukhatme , P.V. Sukhatme, B.V. Sukhatme S. and Ashok, C. (1984): Sampling Theory of Survey with Applications, IASRI Publication, New Delhi.