

**MANGALORE**



**UNIVERSITY**

**Scheme of Examination and Syllabus for  
Ph.D Programme in Statistics**



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**DEPARTMENT OF POST-GRADUATE STUDIES  
AND RESEARCH IN STATISTICS  
MANGALAGANGOTHRI-574 199  
2016**

## Course Work PhD in Statistics Syllabus

### Preamble:

The present syllabus of Ph. D. course work was prepared and implemented during 2016. There was a need to revise the Syllabus to accommodate new research areas. A draft syllabus was placed before the PG board of studies. PG board of Studies in Statistics thoroughly discussed and modified the draft syllabus. The syllabus was prepared as per the regulations of Ph. D. Programme adapted by Mangalore University. There are two papers in the course work for Ph.D

### Paper 1: Research Methodology

### Paper 2: Review of literature

Papers	Particulars	Hours of Instruction Per week	Duration of the exam(Hrs)	Marks			
				IA	Theory	Total	Credits
Paper-1	Research Methodology	4	3	30	70	100	04
Paper-II	Review of Literature Viva	10	-	-	-	150	10
		-	-	-	-	50	
<b>Total</b>						300	14

### Programme Outcomes (POs):

- PO 1: Introduce the overall methodological approach for carry out the research.
- PO 2: Indicate how the approach fits the overall research design.
- PO 3: Provide background and a rationale for methodologies that are unfamiliar.
- PO 4: Describe potential limitations.

### Programme Specific Outcomes (PSOs):

- PSO 1: Researcher should be able to understand a general definition of research design.
- PSO 2: Researchers should be able to identify the overall process of designing a research study from its commencement to its final report.
- PSO 3: Researchers should be familiar with Ethics in Research, Plagiarism, skills related to writing research paper and thesis, Sources of published literature.
- PSO 4: Researchers should be familiar with conducting a literature review for a scholarly educational study with the steps in the overall process.

<b>Paper 1: RESEARCH METHODOLOGY</b>		
<b>Hours/Week: 4</b>		<b>I.A. Marks: 30</b>
<b>Credits : 4</b>		<b>Exam. Marks: 70</b>
<b>Course Outcomes (COs)</b>		
CO1. Understand some basic concepts and properties of research and its methodologies		
CO2. Identify appropriate research topics through Literature Review		
CO3. Understanding and avoiding Plagiarisms		
CO4. Write a research report and thesis		
CO5. Expertise with different techniques involved in the simulation study and its implementation in R - software		
CO6. Strengthening the concept of probability theory and Stochastic process to carry out theoretical research.		
<b>UNIT - I</b>		<b>12 Hrs</b>
Meaning and objectives of research, defining a research problem, literature survey, Sources of published literature – journals, monographs, edited volumes, E-sources, planning a research project. Ethics in Research, Plagiarism, writing research paper and thesis.		
<b>UNIT - II</b>		<b>12 Hrs</b>
Simulation – Reasons for simulations, dangers of simulations, role of models in simulation, development of good simulation models. Variance reduction techniques, Jack-knifing and Bootstrap methods, MCMC methods.		
R language and Use of packages in R.		
<b>UNIT - III</b>		<b>12 Hrs</b>
Probability – Modes of convergence, law of large numbers, Central limit theorems.		
Stochastic Processes- Classification of general stochastic processes, Markov Chains, Poisson Processes, birth-death processes and applications, Weiner Process.		
<b>UNIT - IV</b>		<b>12 Hrs</b>
Numerical solutions of algebraic equations, Method of iteration and Newton-Raphson method, Rate of convergence, Solution of systems of linear algebraic equations using Gauss elimination, Finite differences, Lagrange interpolation, Numerical differentiation and integration.		
<b>References:</b>		
[1] Kothari C R (2004) Research Methodology, Methods and Techniques, New Age International.		
[2] Jain M.K., Iyengar S.R.K. and Jain R.K. (2003): Numerical Methods for Scientific and Engineering Computation, New Age International.		
[3] Louis G. Birta and Gilbert Arbez (2007), Modeling and Simulation, Springer.		
[4] Laha R.G. and Rohatgi V.K. (1979), Probability Theory, John Wiley & Sons.		
[5] Bhat B.R. (2000): Stochastic Models: Analysis and Applications, New Age International.		
[6] Medhi J. (1982): Stochastic Processes, Wiley Eastern		

## Paper II: LITERATURE REVIEW

Hours/Week: 16

Credits : 10

Review of Literature: 150

Viva : 50

### Course Outcomes (COs)

- CO1. Identify the Research gaps in previous studies and progress over time and therefore establishes a foundation on which current research can be based.
- CO2. Collect more information about the current research topic
- CO3. Evaluate pertinent theoretical framework for the current research problem
- CO4. Discover relevant research methodology i.e. methods and approaches that have been successful in similar studies.
- CO5. Validate current arguments based on previous experiential findings
- CO6. Differentiate your approach and arguments and demonstrates your thinking on the subject matter
- CO7. Avoid plagiarism

Contents of the review of literature are based on the research field under the direction of Research Supervisor. Content of the Review report shall include the research problem, summary of the reaserch articles published in the previous years and motivation for the stated research problem.

