

Statistical Methods I

Semester II

Subject Code: BS21505

Lectures : 40

Objectives:

The syllabus aims in equipping students with -

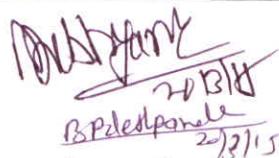
- Ability to prepare for postgraduate work or study in various fields of Statistics.
- Developing attitudes which aim to make them responsible members of the society.
- The methodology of designing research tools and interpretation and analysis of results and report writing.
- Application orientation of logic and objectivity in solution of problems of development and growth.
- Ability to offer research and consultancy services to advance societal development
- Sustainability in emerging process of digital technology and confront the challenges of modern technology and information system.

Unit 1: Regression (for ungrouped data)

No. of Lects.

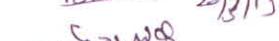
- Regression, illustrations, appropriate situations for regression and correlation (08)
- Linear regression
- Fitting of straight line using least squares method
- Properties of regression coefficients : $b_{xy} \cdot b_{yx} = r^2 \leq 1$, $b_{yx} = r(\sigma_y / \sigma_x)$ and $b_{xy} = r(\sigma_x / \sigma_y)$
- Non-linear regressions models : second degree curve, curve models:
 $Y = ab^X$, $Y = aX^b$
- Numerical Problems

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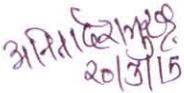
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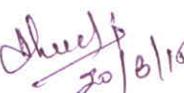
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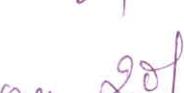
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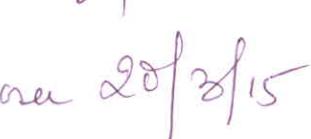
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Anjali Kale



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Amrita Basu



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Unit 2: Multiple and Partial Regression and Correlation (For trivariate data)	No. of Lects.
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- Yule's notation and concept of multiple regression
- Fitting of multiple regression planes
- Partial regression coefficients, interpretation
- Multiple correlation coefficients, concept, definition, computation and interpretation
- Partial correlation coefficients, concept, definition, computation and interpretation
- Numerical Problems

Unit 3: Time Series	No. of Lects.
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- Meaning and utility
- Components of time series
- Additive and multiplicative models
- Methods of estimating trend : moving average method, least squares method and exponential smoothing method
- Elimination of trend using additive and multiplicative models
- Simple time series models : AR(1), AR(2) (only theory)
- Numerical problems

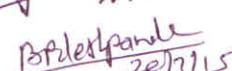
Unit 4: Statistical Quality Control (SQC)	No. of Lects.
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- Introduction to seven process control (PC) tools
- Quality, causes of variation, lot and process control, control charts (X , R , σ - Known & unknown, control limits
- Numerical problems

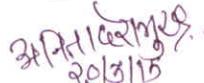
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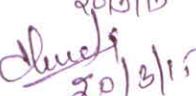
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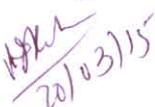
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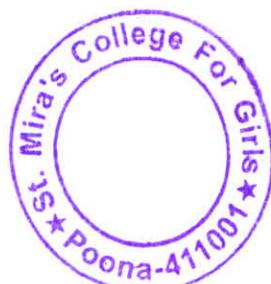
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Unit 5: Index Numbers

	No. of Lects.
<ul style="list-style-type: none"> • Introduction • Definition and Meaning • Points to be considered in construction of Index numbers. • Concept of price and quantity index numbers. • Simple and weighted price index numbers. • Laspeyre's, Passche's and Fisher's Index numbers. • Numerical problems 	(06)

Note : Theorems are to be studied without proof (wherever applicable)

Recommended Text Books:

- Gupta S. C. and Kapoor V. K. 1987, Fundamentals of Applied Statistics (3rd Edition) S. Chand and Sons, New Delhi.
- Kulkarni M.B., Ghatpande S.B., Gore S.D. 1999, Common Statistical Tests Satyajeet Prakashan, Pune
- Kulkarni M.B., Ghatpande S.B. 2007, Introduction to Discrete Probability and Probability Distributions SIPF Academy
- Sarma K.V.S. 2001 Statistics Made Simple. Do it Yourself on P.C. Prentice Hall

Recommended References:

- Medhi J. 1992, Statistical Methods (An Introductory Text), New Age International
- Freund J.E. 2005, Modern Elementary Statistics Pearson Publication
- Trivedi K.S. 2001, Probability, Statistics, Design of Experiments and Queuing Theory with Applications of Computer Science Prentice Hall of India, New Delhi 9
- Ross S. M. 2006, A First Course In Probability 6th Edition Pearson publication
- Law A. M. and Kelton W. D. 2007, Simulation Modelling and Analysis Tata McGraw Hill
- Box G. E. P. and Jenkins G. M. 2008, Time Series Analysis, 4th edition Wiley
- Brockwell P. J. and Davis R. A. 2006, Time Series Methods Springer
- Snedecor G. W. Cochran W. G. 1989, Statistical Methods John Wiley & sons

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