Dr. Bhimrao Ambedkar University, Agra

A State University of Uttar Pradesh (Paliwal Park, Agra -282004)

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A Documentary Support

for

Matric No. – 1.1.1

Programme Outcomes & Course Outcomes

under the

Criteria – I

(Curriculum Design and Development)

Key Indicator - 1.1

in

Matric No. – 1.1.1

MASTER OF STATISTIC

2017

Registrar
Dr. B.R.A. University, Agra

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RAJEEV KUMAR
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Department of Statistics
Institute of Social Sciences

Program Name and Code	**M.Stat./M.Sc. (Statistics)** **Programe Code: 689**
Program Educational Objectives (PEO's)	The primary objective of the M.Stat./M.Sc. (Statistics) is to provide knowledge and expert level skills in the theory, methods and applications of statistics. The program aims to apply statistical techniques for collection, presentation, analysis and interpretation of data and draw valid inferences and also develop programming skill to analyze data using statistical software.
Program Outcomes (PO's) :	On completion of M.Stat. programme, students will be able to • Understand basic theoretical and applied principles of statistics with adequate preparation to pursue PhD or enter the job force as an applied statistician. • Become a Statistician and use their analytic skills in industry, academia, or government organizations. • Apply for the Civil Services, Indian Statistical Services, and Indian Economic Services exams. • Independently carry out research/investigation to solve practical problems

M.Stat./M.Sc. (Statistics): I Semester

Course Code: STAT 101	**Real Analysis and Matrix Algebra**	**Credit: 4** **Max Marks: 75+25 =100**
Course objectives:	To study the theory of Matrix algebra, Vector Space, Sets and Sequence, Riemann Integral	
Course outcomes:	On successful completion of this course, the students will be able to • Conceptualized the fundamentals of vectors and metrics in linear algebra. • Learn various types of sets and relations and concepts of sequence and series • To increase problem solving ability by solving examples and counter examples of various concepts involved.	
Course Code: STAT 102	**Probability and Distribution Theory**	**Credit: 4** **Max Marks: 75+25 =100**
Course objectives:	To introduce the concepts of probability and distribution theory with their important properties	
Course outcomes:	On successful completion of this course, the students will be able to • Understand the different approaches of probability and the concepts of random variables • Identify the type of situations to which different distributions can be applied • Expose the real-life applications of both discrete and continuous distributions	
Course Code: STAT 103	**Sampling Theory**	**Credit: 4** **Max Marks: 75+25 =100**
Course objectives:	To introduce the different techniques of sampling with their respective properties and estimates	
Course outcomes:	On successful completion of this course, the students will be able to	

	• Acquire the basic knowledge of terminologies used in sampling theory • Apply various sampling methods for different data • Explain and compare various sampling schemes • Use practical applications of different sampling procedures	
Course Code: STAT 104	**Computer Science**	**Credit: 4** **Max Marks: 75+25 =100**
Course objectives:	To introduce the elementary concepts of computer with the knowledge of statistical software	
Course outcomes:	On successful completion of this course, the students will be able to • Understand the generation of computer, its types, components and computer languages • Apply basic to advanced features and applications of MS Office • Acquire the knowledge of statistical package SPSS with its practical implementation • Understand basics of R programming and exploratory data analysis through R	
Course Code: STAT 105	**Practical**	**Credit: 4** **Max Marks: 100**
Course outcomes:	On successful completion of this course, the students will be able to • Apply statistical concepts to practical and real life problems	

M.Stat./M.Sc. (Statistics): II Semester

Course Code: STAT 201	**Statistical Inference-I**	**Credit: 4** **Max Marks: 75+25 =100**
Course objectives:	To introduced the elementary and advanced concepts of estimation of parameter and testing of hypothesis	
Course outcomes:	On successful completion of this course, the students will be able to • Understand the problem of statistical inference, point and interval estimation and the properties of estimators • Obtain minimum variance unbiased estimators • Quantify information in statistics using Fisher's Information • Understand the concept of testing of hypothesis and its terminologies, NP Lemma to construct MP test	
Course Code: STAT 202	**Linear Estimation and Design of Experiments**	**Credit: 4** **Max Marks: 75+25 =100**
Course objectives:	To study the concepts of linear models, estimable functions and planning of different experiments through various experimental designs	
Course outcomes:	On successful completion of this course, the students will be able to • Use appropriate experimental design to analyze the experimental data • Predict the behavior of complex systems (experimental, financial and biological data) • Understand factorial design and concept of confounding and use their applications in agriculture, business and industries	
Course Code: STAT 203	**Multivariate Analysis**	**Credit: 4** **Max Marks: 75+25 =100**

Course objectives:	To introduce the concepts of random vector and advanced multivariate analysis	
Course outcomes:	On successful completion of this course, the students will be able to • Understand Wishart Distribution, Hotelling T^2 and Mahalonobis D^2 statistic • Apply dimension reduction technique on real life problems • Understand the multivariate normal distribution and its properties • Demonstrate knowledge and understanding of the basic ideas behind discriminant and clustering analysis techniques with applications	
Course Code: STAT 204 (E)	**Data Analysis using SPSS**	**Credit: 4** **Max Marks: 75+25 =100**
STAT 205 (E)	**Data Analysis using R**	
STAT 206 (E)	**Data Analysis using PYTHON**	
Course objectives:	To study the elementary to advanced concepts of statistical software SPSS, R and PYTHON	
Course outcomes:	On successful completion of this course, the students will be able to • Work with SPSS, R packages and PYTHON and their installation • Demonstrate exploratory data analysis for a given data set • Provide programming skills using job oriented concepts	
Course Code: STAT 207	**Practical**	**Credit: 4** **Max Marks: 100**
Course outcomes:	On successful completion of this course, the students will be able to • Apply statistical concepts to practical and real life problems	

M.Stat./M.Sc. (Statistics): III Semester

Course Code: STAT 301	**Statistical Inference-II**	**Credit: 4** **Max Marks: 75+25 =100**
Course objectives:	To introduce the concepts of asymptotic inference, Sequential analysis and Bayesian Inference	
Course outcomes:	On successful completion of this course, the students will be able to • Understand problem of asymptotic inference and testing of hypothesis with multi parameter cases • Construct SPRT in case of Binomial, Poisson and Normal Distribution • Develop the knowledge for the field for fundamental Lemma's and theorems • Apply the concepts of Bayesian inference in different fields of applications	
Course Code: STAT 302	**Operations Research**	**Credit: 4** **Max Marks: 75+25 =100**
Course objectives:	To learn conversion of real life problems into mathematical models which enhance their problem solving and decision making abilities	
Course outcomes:	On successful completion of this course, the students will be able to • Calculate optimal solution of models through graphical and iterative methods • Get optimum optimal solution within in the given constraints to problems arising I n industry. • Build and solve Game theory, PERT/CPM, Simulation, investment	

	analysis with real life applications	
Course Code: STAT 303(E)	**Data Mining**	**Credit: 4** **Max Marks: 75+25 =100**
Course outcomes:	• Understand fundamentals of data mining, data warehousing, data visualization • Use classification and prediction methods in real life problems • Apply regression models for prediction	
304(E)	**Population Studies**	
Course outcomes:	• Understand the measures of mortality, fertility and interdisciplinary nature of Demography, balancing equation, use of indices • Describe the concept of life table • Apply Quasi, stable population models	
305(E)	**Medical Statistics**	
306(E)	**Official Statistics**	
Course outcomes:	• Understand the concept of censoring, life distribution and ageing classes • Learn role of NSSO and other agencies responsible for data collection • Understand national income and its computation	
307(E)	**Econometrics**	
Course outcomes:	• Understand the elementary and advanced concepts of econometrics and their models and methodology • Learn nature of Heteroscedasticity and its consequences • Describe auto correlation, its detection and remedial measures	
308(E)	**Actuarial Statistics**	
Course Code: STAT 207	**Practical**	**Credit: 4** **Max Marks: 100**
Course outcomes:	On successful completion of this course, the students will be able to • Apply statistical concepts to practical and real life problems	

M.Stat./M.Sc. (Statistics): IV Semester

Course Code: STAT 401(E)	**Decision Theory and Bayesian Inference**	**Credit: 4** **Max Marks: 75+25 =100**
Course outcomes:	• Understand the concept of decision problem, decision rule loss function, expected loss in the context of decision theory • Describe the theory of Bayesian point estimation and Bayesian interval estimation • Learn the basic concepts of Bayesian testing of hypothesis	
STAT 402(E)	**Advanced Sample Survey**	
Course outcomes:	• Learn the theory of fixed population approach • Describe the concepts of inference under super population model and prediction approach • Understand the basic theory of small area estimation and calibration approach • Apply the concept of large scale surveys and categorical data analysis and practical survey examples	
STAT 403(E)	**Sequential Analysis**	
STAT 404(E)	**Limit Theorem and Stochastic Processes**	
Course outcomes:	• Understand the sequences of events and random variables, probability inequalities, convergence theorems	

	• Apply WLLN, SLLN, CLT and other limit theorms and their practical implementation • Learn stochastic process, markov chains, transition probability matrix and various types of states • Explain random walk and apply poisson process in real life situations	
STAT 405(E)	**Data Science**	
STAT 406(E)	**Reliability Theory and Survival Analysis**	
STAT 407(E)	**Linear Model and Regression Analysis**	
STAT 408(E)	**Research Methodology**	
Course outcomes:	• Understand the role of research and its objectives • Learn various research design and survey methods • Apply measurement and scaling techniques to prepare questionnaire and schedule • Explain different tools of analyzing data manually and through software • Describe the way of report writing	
STAT 409(E)	**Marketing Research Statistics**	
Course outcomes:	• Learn the elementary idea behind marketing system and recent innovation in modern marketing • Understand the sampling plan for marketing survey • Explain the decision support system model and stochastic models of brand choice • Describe the consumer satisfaction index, brand preference index, brand awareness index	
Course Code: STAT 410	**Practical**	**Credit: 4** **Max Marks: 100**
Course outcomes:	On successful completion of this course, the students will be able to • Apply statistical concepts to practical and real life problems	

Head, Department of Statistics,
Institute of Social Sciences,
Dr. Bhimrao Ambedkar University, Agra.