DEPARTMENT BROCHURE

TWO YEAR POSTGRADUATE PROGRAMME

DEPARTMENT OF STATISTICS
UNIVERSITY OF DELHI
2019-2021

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From the
Head of the Department's Desk

Prof. Gurprit Grover

Dear Reader,

Welcome to the Department of Statistics at University of Delhi. We started our journey in the year 1973. Over the last four decades , we have grown our expertise and competence in the core Statistics curriculum and research. Needless to say, this program has stood the test of time and has been accorded its due place in the corporate world as well as academic. Through this brochure we attempt to present a sketch of the Department and its activities. Further , the curriculum taught has a wide range of applications in the industry. The primary focus of our curriculum is designed to impart technical know-how to students, promote their problem solving skills and make them ready to implement the theory. The curriculum is designed to provide a wide spectrum of options to the students to pursue their interests both in applied and theoretical aspects of the subject. The course contents are periodically updated for introducing newer subjects and technical developments in the subject. Our department looks forward to contribute in solving challenges faced by people with active participation from all sections of society.

Thank you for visiting us.
Prof. Gurprit Grover
Head of the Department, Department of Statistics

About us

University of Delhi

The University of Delhi is considered to be one of the best multidisciplinary schools in India. Founded in 1922, it is one of the few top universities in the country that focuses on multifaceted education. It offers courses in 86 departments, spreads across two campuses in Delhi, enrolling over 2 lakh students every year. In the QS India University Rankings 2018-19, the university occupies its position in top 10 universities. The rankings are based upon four criteria: internationalisation, teaching, employability, and research.

Department of Statistics

The Department of Mathematical Statistics was established in August 1973, with Prof. H. C. Gupta as its first Head of Department. Although the teaching of M.A. in Mathematical Statistics had been introduced as early as July 1957 at the initiative of Professor Ram Behari as part of a development program introduced by the Department of Mathematics. Ever since its inception, a strong commitment to excellence in teaching and research along with a practical approach towards education has attracted talented students from all over the country, who have later gone on to make significant contributions in the field of Statistics. In 1971, the M. Sc. degree in Mathematical Sciences was introduced. The Department currently offers post-graduate (M.A./M.Sc.), M.Phil. and Ph.D. programmes in Statistics. The Masters programme offers rigorous training in statistical methods coupled with specialisations and exposure to latest state-of-the-art programming languages and computer software which aim to provide students with a profile suited for both, the industry and the academia. The selection procedure for the post-graduate programme consists of an entrance examination, based on statistical fundamentals and mathematical understanding, held all over the country.

Infrastructure

Library

The Central Science Library's extensive resources are an invaluable aid to both students and faculty. The library houses more than two titles and subscribes to over 500 nationally and internationally acclaimed magazines, periodicals and journals with archives of over two decades. The department also has its own library and internet facility.

Computer Labs

The Computer Labs of our department have well-equipped computing resources and extremely competent faculty. They provide a thorough hands-on experience of data handling and statistical problem solving. Students are trained in a variety of computer languages and statistical by the industries today.

Seminar Rooms

Seminar rooms are made available to encourage discussion, enable group work and other collaborative learning projects. These rooms are equipped with modern audio-visual facilities including LCD projectors and microphone sets for an enriched experience of an e-classroom.

FACULTY MEMBERS

HEAD OF THE DEPARTMENT

Prof. Gurprit Grover

Professor

Qualification: Ph.D., University of Delhi

Field: Biostatistics, Statistical Quality Control, Demography and Reliability

Prof. Poonam Singh

Professor

Qualification: Ph.D., University of Delhi

Field: Design of Experiments, Generalized Linear Models, Optimization, Statistical Quality Control and Operations Research

Dr. Ranjita Pandey

Assistant Professor

Qualification: Ph.D., University of Lucknow

Field: Demography, Inferential Reliability, Econometrics, Time Series Analysis, Explanatory Data

Dr. Taruna Kumari

Assistant Professor (on Adhoc basis)

Qualification: Ph.D., University of Delhi

Field: Reliability and Life Testing, Linear Algebra, Multivariate Analysis, Generalized Order Statistics, Language - C and R , Software - SPSS

Ms. Kanika Verma

Assistant Professor (on Adhoc basis)

Qualification: M.Phil., University of Delhi

Field: Generalized Order Statistics, Record Values, Mathematical Analysis, Linear Algebra, Econometrics , Time Series

Dr. Renu Garg

Assistant Professor (on Adhoc basis)

Qualification: Ph.D., Maharshi Dayanand University

Field: Bayesian Inference, Reliability and Life Testing Experiment

Dr. Zuber Akhter

Assistant Professor (on Adhoc basis)

Qualification: M.Phil, Ph.D., Aligarh Muslim University, Aligarh

Field: Statistical Inference,Order Statistics Records, Generalized Order Statistics

SOCIETIES

Credence: The Placement Cell

The main responsibility of Credence is to facilitate the Summer Internship and Final Placement process held at the Department. From mentoring the students through mock aptitude tests to providing them with the Companies' recruitment criteria, managing the profile database of the students along with pushing for industry-student interactions through on-campus visits and presentations are some of the tasks that the Placement concern themselves with.

UDAAN: The Socio-Cultural Cell

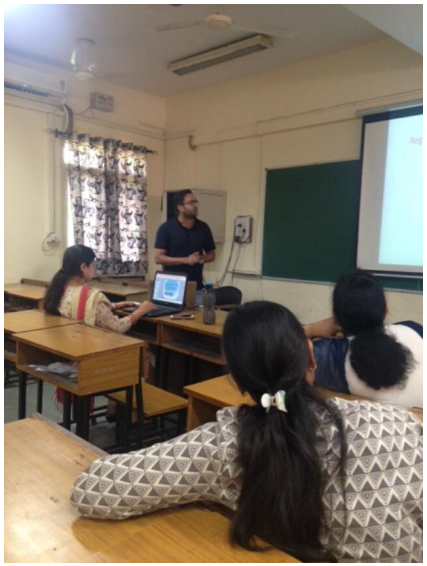
UDAAN: The Socio-Cultural Cell of Department of Statistics, University of Delhi was formed in the year 2016. It aims at achieving the following goals through its different wings and engines:

- Creation and management of online magazine, blog, Department Facebook group and Instagram handle.
- Organization of dance, drama and music events, cloth collection drives, blood donation camps, Environmental awareness programs and other community and social services programs, Alumni Meets, workshops, and special lectures.
- Seminars by inviting eminent speakers from our own university and other institutions.
- Conceiving and working towards organization of the Department Fest.
- Educating the youth about Gender Equality by conducting Gender Sensitization programs.

The Heritage Club

The Heritage Club of the Department of Statistics, University of Delhi was formed with the vision of reviving Indian Culture and its prominent historic significance among the students. In regards to this, a talk on importance of Yoga and meditation by Yogi Hemanti Mukhopadhyay in association with SPIC MACAY society was organized in order to help students understand the value of incorporating an ancient practice of physical, mental and spiritual disciplines into their lives. This talk was also followed by an implementation session by the speaker. Inspired by the Fit India movement, a “Sports Meet” was organized wherein traditional games like kho-kho tug of war, was conducted in the department. India , home to numerous heritage sites, an annual “Heritage Walk” is conducted. This walk is a one day visit to monuments, archeological parks etc. As part of this event, a walk to Tughlaqabad Fort and Mehrauli archeological has been organized so far. Apart from these, we have organized a Rangoli competition on Holi, and to commemorate the harvest festival of Punjab, a bonfire and dance was organized on Lohri.

Research Activity Cell



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Course Structure

Semester I

THEORY:

- Analysis
- Probability Theory
- Statistical Methodology
- Survey Sampling

PRACTICALS:

- Data Analysis - I (using Excel)
- Statistical Computing - I (using C language)

Semester II

THEORY:

- Linear Algebra
- Stochastic Processes
- Statistical Inference - I
- Design of Experiments

PRACTICALS:

- Data Analysis - II (using Excel)
- Problem Solving using C language

Semester III

THEORY:

Core:

- Statistical Inference - II
- Multivariate Analysis
- Generalised Linear Models

Electives:

- Bio - Statistics
- Operational Research
- Non - Parametric Inference
- Financial Statistics

PRACTICALS:

- Statistical Computing- II (using R software)
- Problem Solving using SPSS - I

Semester IV

THEORY:

Core:

- Econometrics and Time Series Analysis
- Demography, Statistical Quality Control and Reliability

Electives:

- Applied Stochastic Processes
- Order Statistics
- Bayesian Inference
- Advanced Survey Sampling Theory
- Advanced Theory of Experimental Designs
- Advanced Statistical Computing and Data Mining

PRACTICALS:

- Problem - Solving using R software - II
- Problem Solving using SPSS - II

COURSE HIGHLIGHTS

Theoretical Statistics

University of Delhi has always stood for the best in education and pedagogy. The Masters of Statistics program offers a perfect blend of fundamental training in statistical methods coupled with practical applications to cater to all industry oriented needs. The curriculum is designed to promote deep understanding of the concepts.

Stochastic Processes

- Poisson process
- Birth - death process
- Brownian motion
- Branching process
- Martingales

Bayesian Inference

- Computation of posterior distribution
- Loss and utility function
- Generalised ML estimation
- Hypothesis testing
- Bayesian interval estimation

Order Statistics

- Distribution theory
- Order statistics as Markov chain
- Asymptotic distribution
- Random division of an interval
- Rank order statistics related to simple random walk

Design of Experiments

- Linear estimation
- ANOVA
- Incomplete Block Design
- Finite field and finite geometry
- Factorial experiments
- Confounding
- Fractional factorial experiments

Generalised Linear Models

- Logistic regression
- Poisson regression
- Log - linear models
- Family of GLM
- Power class link functions
- Quasi likelihood

Statistical Inference

- Sufficiency, efficiency and MLE
- NP lemma, LR test, large sample tests
- Interval estimation
- SPRT and its properties
- Non - parametric methods
- Rank order and linear rank statistics

Multivariate Analysis

- Multivariate distribution
- Wishart matrix
- Hotelling's T2 - statistics
- Factor and cluster analysis
- Multivariate regression

Probability Theory

- Random variables
- Probability distributions
- Law of large numbers
- Concept of independence
- Modes of convergence

Applied Statistics

Advanced Theory of Experimental Designs

- Partially Balanced Incomplete Block design
- Fractional Factorial plans
- Orthogonal arrays
- Weighing designs
- Response surface designs
- Mixture experiments
- Cross - over designs

Econometrics

- GLM with stochastic regressors
- Instrumental variables
- Bayesian analysis of GLM
- Distributed Lag models
- Simultaneous equations model

Bio-statistics

- Analysis of Epidemiology & Clinical data
- Different types of censoring
- Survival time distributions, comparison of survival distributions
- Competing Risk theory
- Sensitivity, Specificity & Predictivity Analysis, ROC curve
- Estimation of Odd's ratio and Relative risk
- Various Epidemic models
- Statistical genetics, plannning & design of Clinical trials

Statistical Quality Control

- Product & process control, control charts
- CUSUM charts
- V mask & decision interval technique
- Economic design of X-bar chart
- Sampling inspection plans

Financial Statistics

- Stochastic calculus
- Derivatives, pricing & hedging
- Random walk, CRR model
- Black Scholes PDE, Martingales
- Options, Forward rates modelling

Demography

- Measures of mortality & fertility
- Construction of different life tables
- Relationships between life table functions
- Population growth models
- Population projection

Data Mining

- Artificial Neural network
- Clustering and Market segmentation
- Principal Component Analysis
- Classification & Regression trees
- Statistical simulations
- Expectation - Maximisation algorithm

Operational Research

- Linear programming
- Transportation problems
- Game theory & Simulations
- Inventory theory
- Decision Analysis

Time Series & Forecasting

- Time Series as a discrete parameter
- Stochastic process
- Moving average, Auto regressive, ARMA & ARIMA models
- Exponential & adaptive smoothing methods

Reliability

- Reliability & expected longevity of different types of systems with applications, maintained & non-maintained systems with their reliability & expected longevity
- estimation of reliability & expected survival time for censored failure time data
- Preventive maintenan-ce policy

Focus Areas

I

Actuarial Analytics:
Helps an organization in providing services that focus on risk management and allows one to make informed business decisions.

II

Bio - Statistics:
Involves translating data into meaningful information that can then be used to make logical and beneficial public health decisions.

III

Business Analytics:
Useful to make data - driven decisions; the insight gained enables companies to automate and optimize their business processes.

IV

Data Science:
A concept to unify statistics, data analysis and their related methods in order to understand and analyse actual phenomena with data to make informed decisions to drive the company forward, improve efficiency, increase profits and achieve set targets.

V

Data Analysis:
Includes cleansing, transforming, and modelling data with the goal of discovering useful information, informative conclusions, and supportive decision making.

VI

Demography:
Seeks to understand population dynamics by investigating demographic processes; understanding social and economic problems and identifying solutions.

Focus Areas

VII

Consulting & Advisory:
Paves the way to make suitable changes in the business, analyse business problems and come out with possible ways to deal with it.

VIII

Financial Statistics:
Studies past behaviour, forecasts future behaviour of financial securities and markets in a broad geographic region.

IX

Market Research:
Provides important information which helps to identify and analyze the needs of the market, the market size and the competition.

X

Operational Research:
Quantifies the relevant factors of an issue and uses mathematical techniques to arrive at an optimal decision and is used to solve complex problems under uncertainty.

XI

Risk Analytics:
Develops models to protect against unforeseen risk and reduce regulatory capital, optimize and mitigate risks that can negatively affect the organization's products or services.

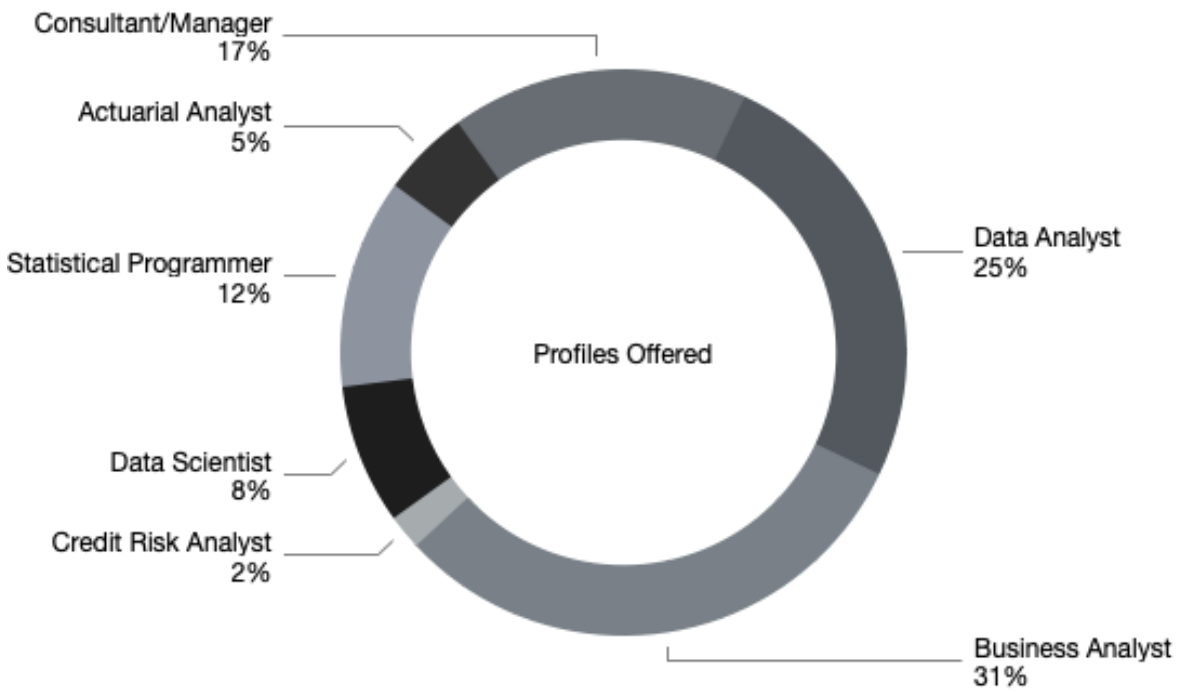
XII

Sports Analytics:
Gives a competitive edge to a team or individual, focuses on organisations to take better decisions for higher growth and increased profitability.

Placement Records

2019-2020

We are pleased to be able to proclaim that 2019-20 has been a very fruitful session for Credence with more than 90% students successfully placed in reputable organisations all over the country.



₹ 18 LPA
Highest Package Offered

₹ 7.70 LPA
Median Package Offered

47
Students Placed

52
Offers Made

PAST RECRUITERS

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Contact Us

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