# हंसराज महाविद्यालय

दिल्ली विश्वविद्यालय
महात्मा हंसराज मार्ग,
मलकागंज, दिल्ली -110007
दूरभाष : 011-27667458, 27667747
ई-मेल : principal_hrc@yahoo.com
वेबसाइट : www.hansrajcollege.ac.in

# HANSRAJ COLLEGE

UNIVERSITY OF DELHI
Mahatma Hansraj Marg
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Website: www.hansrajcollege.ac.in

## NAAC ACCREDITED 'A++' GRADE COLLEGE

### 2024-2025

**IQAC centre:** Student Learning Centre, Hansraj College

**Centre Coordinator:** Dr. Pooja Arora

**Name of the course:** Statistics and Data Analysis with R (SLC19)

**Course Instructor:** Mr. Ishan Hazarika

**Course Coordinator:** Dr. Madhavi Moni K, Dr. Anurag Kakkar & Dr Ashutosh Yadav

**Student Coordinator:** Muskan

**Start Date:** 20 October 2024

**End Date:** 26 January 2025

**Duration:** 99 days

**Number of Registered Participants**: 21

**Number of Participants who successfully finished the course**: 19

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**Report:**

| Session | Description |
|---------|-------------|
| 1 | Introduction to Data & R interface |
| 2, 3 | Basics of R: importing and cleaning data, vectors, lists, matrices, factors, frames, loops, dates and functions |
| 4, 5 | Data Wrangling: Arrange, filter, mutate, group, summarize, rename, select and relocate data |
| 6, 7 | *Practice sessions for Data Wrangling* |
| 8 | Data Visualization I: different geometries and aesthetics |
| 9,10 | Data Visualization II: non-data elements of visualizations like themes, statistics, facets and coordinates |
| 11, 12 | *Practice sessions for Data Visualization* |
| 13 | Data Manipulation: aggregating and transforming data, joining tables |
| 14, 15 | *Practice sessions for Data Manipulation, Data Wrangling and Data Visualization* |
| 16, 17 | Introduction to Statistics in R: descriptive statistics, probability of events, correlation |
| 18, 19 | Probability distributions in R: Discrete and continuous distributions |
| 20, 21 | *Practice sessions on Statistics with R* |
| 22, 23 | Sampling in R: different types of sampling techniques, sampling distribution |
| 24, 25 | Sampling in R: Approximating sampling distribution, bootstrapping and Central Limit Theorem |

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| 26 | Hypothesis Testing in R |
|---|---|
| 27, 28 | *Practice sessions for sampling and hypothesis testing* |
| 29 | *Case Study I* |
| 30 | *Case Study II* |

The add-on course was conducted successfully and turned out to be a very enriching experience for the students. The sessions were held regularly and delivered in a structured and systematic manner. Mr. Ishan, the resource person, explained concepts clearly and was very approachable, which encouraged students to engage actively. His teaching style made the classes interactive and enjoyable.

The course was particularly helpful in introducing students to **R programming** and its practical applications in statistical analysis. Along with technical knowledge, it also enhanced analytical and problem-solving skills, making the learning experience more holistic. Students felt that the course was highly relevant to their academic as well as career interests.

The course covered R basics, data wrangling, visualisation, descriptive statistics, probability, sampling, and hypothesis testing, culminating in two case studies. By the end of the course, participants were able to:

- Navigate R and work with common data structures; import, clean, transform, and join datasets.

- Produce publication-quality visualisations and summarise data descriptively.

- Understand probability concepts/distributions and apply sampling techniques (incl. bootstrapping, CLT intuition).

- Conduct basic hypothesis tests in R and interpret results in applied case studies.

Overall, the course was extremely beneficial and well-received. The participants expressed high satisfaction with the sessions and recommended its continuation in the future. With minor

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improvements such as pacing adjustments and a slightly stronger balance between theory and practice, the course can become even more impactful.

**Feedbacks**:

1. Strong learner satisfaction: high ratings for the resource person's knowledge (3.76/4) and explanation effectiveness (3.65/4). Overall satisfaction averaged (3.41/4)
2. Students valued approachability and practical orientation; suggested fine-tuning pace/structure and offering follow-on modules (e.g., Python/C++).

In sum, the add-on course met its core objective of building practical, confidence-driven proficiency in R while deepening statistical thinking from description to inference. The strong learner feedback on expertise, clarity, and applicability affirms the value of our practice-first approach, even as suggestions on pacing, structure, and advanced pathways give us a clear roadmap for improvement. Going forward, we will integrate short check-ins, compact handouts/cheat-sheets, and micro-assessments, and offer progression tracks (Intermediate R, Python) to sustain momentum. Most importantly, the two capstone case studies have seeded a culture of evidence-based analysis that students can carry into academic work, placements, and projects. We acknowledge the committed facilitation by the course team and thank the learners for their constructive engagement.

**Brochure:**

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**HANSRAJ ECONOMICS SOCIETY**

IN COLLABORATION WITH

**IQAC**
and
**STUDENT LEARNING CENTRE**
HANSRAJ COLLEGE

presents

**SLC-19 ADD-ON CERTIFICATE COURSE ON INTRODUCTION TO STATISTICS USING R**

**OCTOBER 19-DECEMBER 8, 2024**

### About the course

A Beginner friendly online add-on certificate course dedicated to data analysis and statistical computing for skill enhancement.

### Learning Outcomes

Starting from the very basics of R programming to writing code for regression analysis, this course navigates from beginner level to intermediate proficiency

### Eligibility

Open to students from all colleges and universities
No prior knowledge of any programming language required

### Workshop Outline:

- Introduction to Data & R interface
- Basics of R
- Data Wrangling
- *Practice sessions for Data Wrangling*
- Data Visualization I
- Data Visualization II
- *Practice sessions for Data Visualization*
- Data Manipulation
- *Practice sessions for Data Manipulation, Data Wrangling*
- Introduction to Statistics in R
- Probability distributions in R
- *Practice sessions on Statistics with R*
- Sampling in R
- Hypothesis Testing in R
- *Practice sessions for sampling and hypothesis testing*
- *Case Study I*
- *Case Study II*

### Important Details

- Starting on October 19,2024
- Timings: 5pm to 7pm, Saturdays and Sundays
- Live Sessions of 30 hours.
- The course also includes: Assessments, Assignments and Feedback Master Class
- Certificate on the successful completion of the course
- Registration Fee - Rs. 1000 (Rs. 500 for Hansraj Students)
- Last date for registration - 17th October, 2024
- Registration confirmation mails will be sent by 18th October, 2024

### Register here:

https://forms.gle/SNw8LaKqDVWb1FFb7

### Payment Details:

Course Fees: Rs. 1000 (Rs. 500 for Hansraj Students)
Account Name: Principal, Hans Raj College SLC account
Account Number: 2848101019888
Bank: Canara Bank
IFSC: CNRB0002848
Course fees is non-refundable

### For Queries Contact us:

Nandani: +91 8368483390
Muskan: +91 93199 67878

Prof. (Dr.) Rama
Principal
Hansraj College

Ms. Alka Kacker
Director, IQAC
Hansraj College

Dr. Pooja Arora
Convenor
Student Learning Centre

Dr. Vinod Kumar Mayala
Convenor
Hansraj Economics Society

Course Coordinators
Dr. Anurag Kakkar
Ms. Madhavi Muni K

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**Some Pictures:**

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| Year | Price (Rs./ kg) in Assam | Price squared | |
|------|------|------|------|
| 2020 | 200 | 40000 | 96250 |
| 2021 | 400 | 160000 | - |
| 2022 | 250 | 62500 | 90000 |
| 2023 | 350 | 122500 | = |
| Mean | 300 | 96250 | 6250 |
| Mean Squared | 90000 | | |

Another recipe for variance

1. Find the mean of the prices
2. Find the square of the answer from step 1
3. Find the squares of each price
4. Find the mean of the answer from step 3
5. Subtract the answer from step 2 from the answer from step 4

**List of registered participants:**

| S.No. | Name of the Student | Email address of the student | Name of the College/Institution |
|-------|---------------------|------------------------------|----------------------------------|
| 1 | Pawni Chaurasia | gacosmo1.618@gmail.com | Hansraj College |
| 2 | Varchasvi | varchasvit@gmail.com | Hansraj College |
| 3 | Sehaj verma | sehajverma308@gmail.com | Hansraj College |
| 4 | Ansi Verma | ansiverma14@gmail.com | Hansraj College |

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| 5 | Vansh Arora | vansharora150307@gmail.com | Hansraj College |
| 6 | Daksh Sharma | dakshsharma2712@gmail.com | Hansraj College |
| 7 | Hardik Jindal | hardik0812jindal@gmail.com | Hansraj College |
| 8 | Vaibhav khetan | vaibhavkhetan156@gmail.com | Hansraj College |
| 9 | Aarju | choudharyaarju82@gmail.com | Hansraj College |
| 10 | Muskan | muskanaryan1153@gmail.com | Hansraj College |
| 11 | Naorem Nitish Singh | naoremnitish7@gmail.com | Hansraj College |
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| 13 | Palak | palakbhaskar00@gmail.com | Hansraj College |
| 14 | Arkaneel Das | arkaneel2003@gmail.com | Hansraj College |
| 15 | Bhavye Wadhawan | bhavyewadhawan2007@gmail.com | Hansraj College |
| 16 | Aditya Kumar Sinha | sinhaaditya069@gmail.com | Hansraj College |
| 17 | Prateek sinha | prateeksinha7011@gmail.com | Hansraj College |
| 18 | Janvi Allawadhi | janviallawadhi@gmail.com | Hansraj College |
| 19 | Mayank | mayankaggarwal2151@gmail.com | Hansraj College |
| 20 | Anand Agrawal | anand.agrawal2019@gmail.com | Hansraj College |
| 21 | Ayushman raina | aayushmanraina29@gmail.com | Hansraj College |

**Attendance Details:**

| NAME | SEM | 2O Oct | 2 Oct | 27 Oct | 2 Nov | 3 Nov | 16 Nov | 17 Nov | 24 Nov | 30 Nov | 01 Dec | 08 Dec | 21 Dec | 25 Jan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pawni Chaurasia | 1 | P | P | P | A | A | A | P | P | A | A | P | P | A |
| Varchasvi | 1 | A | P | P | A | A | A | A | A | A | A | P | P | A |
| Sehaj verma | 1 | P | P | P | P | P | P | P | P | P | P | P | P | A |

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| Name | No. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ansi Verma | 1 | P | P | A | P | P | A | A | A | P | A | P | P | A |
| Vansh Arora | 1 | P | P | P | P | P | A | P | A | A | P | P | A | A |
| Daksh Sharma | 1 | P | P | P | A | P | A | A | A | A | P | A | P | A |
| Hardik Jindal | 1 | P | P | P | P | P | P | P | P | P | P | P | P | P |
| Vaibhav khetan | 1 | A | A | A | A | A | A | A | A | A | A | A | A | A |
| Aarju | 1 | P | P | P | P | P | A | A | P | A | P | A | P | A |
| Muskan | 3 | P | P | P | P | P | P | P | P | P | A | P | P | P |
| Naorem Nitish Singh | 3 | P | A | A | A | A | P | P | A | A | P | A | A | A |
| Raghav bansal | 1 | P | P | P | A | P | P | A | A | P | P | A | P | A |
| Palak | 1 | A | P | A | P | A | A | A | A | A | A | A | P | A |
| Arkaneel Das | 1 | P | A | P | A | P | A | P | A | A | A | P | A | A |
| Bhavye Wadhawan | 1 | P | P | P | A | A | A | A | A | A | A | A | A | A |
| Aditya Kumar Sinha | 1 | P | P | P | P | A | A | P | P | H | P | P | P | P |

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| Prateek sinha | 1 | P | P | P | P | P | P | P | P | P | P | P | P | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Janvi Allawadhi | 3 | A | P | A | P | P | P | P | P | P | P | P | P | A |
| Mayank | 3 | P | A | P | A | A | P | P | P | P | P | P | A | P |
| Anand Agrawal | 1 | P | P | P | P | A | P | P | P | P | P | P | P | P |
| Ayushman raina | 1 | P | P | P | P | P | A | P | P | A | A | P | P | A |