DEPARTMENT OF ECONOMICS
BARASAT GOVERNMENT COLLEGE

organizes

VALUE ADDED COURSE on APPLIED STATISTICS & ECONOMETRICS

33 Contact Hours

Certificate on successful Completion

Registration is compulsory for participation

Chief Patron

Dr. Samar Chattopadhyay
Principal
Barasat Government College

Registration link

https://forms.gle/1kWghKcdDBcHHjg97

A Value Added Course
On
APLLIED STATISTICS AND ECONOMETRICS
Conducted by
Department of Economics
BARASAT GOVERNMENT COLLEGE

(COURSE CODE: BGC ECO 01 VAC ACADEMIC SESSION-2022-23)

Programme Specific Outcome

The programme is designed in a way so that it can serve the following purposes :

- Students will learn big data handling and the skill is required for cutting edge quantitative research.
- Also the course focuses on in-depth learning of survey methodology as it is extremely vital to carry out any empirical research.
- Students are also exposed to different sampling technique which will help in conducting primary survey.
- The programme will be helpful in gathering knowledge on the different type of data, fundamental analysis using any given dataset, hypothesis testing, performing statistical tests, and large sample tests.
- The course also covers multiple regression analysis and multivariate tests for real life problems based on type of data which will strengthen the analytical skills of the students.
- Further, the students will be exposed to the methods or models used in pure sciences, to study different economic phenomenon. For example, the Kinetic theory model in Physics is now used to study income inequality in development economics. The basic of Econophysics will be introduced to them through this course.
- This course is curated in such a way that the knowledge and skill gathered through this course will help the students immensely in conducting and writing a high quality project report in final semester of UG Economics (Hons) course.
- The program is helpful for students who will seek for jobs especially in administrative services and financial institutions. The understanding of the Indian economy and its institutions along with the knowledge of statistical and econometric techniques and packages place them in an advantageous position in the job market.
- The programme will be helpful for those who pursue further study in the field of economics, applied economics, applied statistics, finance and management. Further, in today's data-driven world, skills on managing, handling of large chunks of data along with eye-grabbing

data representation and proper analysis and forecast is essential. Thus this programme will enable students to acquire all these skills and find themselves in advantageous position in the job market.

Duration of the Course: 33 hours
Evaluation: Continuous evaluation through MCQ tests, Tutorials, Spot Assignment
Full Marks: 100 ***Pass Marks:*** 40

Resource Persons

1. **Prof. Samar Chattopadhay**, Principal, Barasat Govt. College
2. **Prof. Sudip Mukherjee**, Assistant Professor, Department of Physics, Barasat Govt. College
3. **Prof. Anindita Sengupta**, Associate Professor, Dept. of Economics, Barrakpore Rastraguru Surendranath College, West Bengal
4. **Prof. Debarshi Mondal**, Associate Professor, Dept. of Economics, Chandernagore College, Govt. of West Bengal
5. **Prof. Puja Biswas**, Assistant Professor & HoD, Prasanta Chandra Mahalanobis, Mahavidyalaya, West Bengal
6. **Prof. Rajnarayan Gupta**, HoD & Associate Professor, Dept. of Economics, Barasat Govt. College
7. **Prof. Rongili Biswas**, Associate Professor, Dept. of Economics, Barasat Govt. College
8. **Prof. Dola Chattopadhyay**, Assistant Professor, Dept. of Economics, Barasat Govt. College
9. **Prof. Kaushiki Banerjee**, Assistant Professor, Dept. of Economics, Barasat Govt. College

Number of Students Participated: 29

Number of Students Passed: 29

DETAILED PROGRAMME SCHEDULE

APPLIED STATISTICS AND ECONOMETRICS

A Value Added Course conducted by Department of Economics, Barasat Government College

Day 1: 5/06/2023 (Monday), Time: 11 am to 5.00 pm.

Topic	Duration	Course Content	Resource Person
Formal Inauguration of the Course	11 am -11.30 am		
Inaugural Address	11.30am–12.00 am		**Dr. Samar Chattopadhyay** **Principal** **Barasat Govt. College**
Foundations of Statistics	12.00am -2.00 pm	**Data collection, Central tendency Dispersion,Skewness and Kurtosis**	Prof. Rongili Biswas Associate Professor Dept. of Economics BarasatGovt.College
Break	2.00 pm—2.30pm		
Tutorial Discussion on the Topic	2.30 pm –4 pm	Interactive session between Resource person and participants	Prof. Rongili Biswas
Evaluation	4pm –5pm	MCQ questionnaires/ Spot Assignments	Prof. Rongili Biswas

Day 2: 7/06/2023 (Wednesday), Time: 11 am to 5 pm.

Topic	Duration	Course Content	Resource Person
Bivariate DataAnalysis	11 am -1.00 pm	**Concept of correlation, Regression, Estimation and Hypothesis testing**	Prof. Dola Chattopadhyay Assistant Professor Dept. of Economics.BGC
Tutorial Discussion on the Topic	1.00 pm--1.30pm	Interactive sessionbetween Resource person and participants	Prof. Dola Chattopadhyay
Evaluation	1.30 pm –2.15 pm	MCQ questionnaires/ Spot Assignments	Prof. Dola Chattopadhyay
Break	2.15 pm —2.45m		
Introduction to Official Statistics	2.45pm–3.45pm	**Different sources of official statistics in India**	Prof. Kaushiki Banerjee Assistant Professor Dept. of Economics.BGC
Tutorial Discussion on the Topic	3.45 pm –4.15pm	Interactive session between Resource person and participants	Prof. Kaushiki Banerjee

Evaluation	4.15pm –5pm	MCQ questionnaires/ Spot Assignments	Prof. Kaushiki Banerjee

Day 3: 9/06/2023 (Friday), Time: 11 am to 5 pm.

Topic	Duration	Course Content	Resource Person
Concept of probability and distribution	11 am -1.00 pm	**Classical and Axiomatic concept, Binomial, Poisson,Normal, Uniform, Hypergeometric prob. distribution.**	Prof. Rajnarayan Gupta HOD & Associate Professor Dept. of Economics BarasatGovt.College
Tutorial Discussion on the Topic	1.00 pm--1.30 pm	Interactive session between Resource person and participants	Prof. Rajnarayan Gupta
Evaluation	1.30 pm –2.15 pm	MCQ questionnaires/ Spot Assignments	Prof. Rajnarayan Gupta
Break	2.15 pm —2.45m		
EmpiricalResearch and Vital Statistics	2.45pm –3.45pm	**Stages of Empirical Research, Survey Methodology, Different vital statistics**	Prof. Anindita Sengupta Associate Professor Dept. of Economics Barrakpore Rastraguru Surendranath College
Tutorial Discussion on the Topic	3.45 pm –4.15pm	Interactive session between Resource person and participants	Prof. Anindita Sengupta
Evaluation	4.15 pm –5pm	MCQ questionnaires/ Spot Assignments	Prof. Anindita Sengupta

Day 4: 12/06/2023 (Monday), Time: 11 am to 5 pm

Topic	Duration	Course Content	Resource Person
Econometric Analysis	11 am -1.00 pm	**Classical Linear Regression Model…Bivariate & Multivariate**	Prof. Dola Chattopadhyay Assistant Professor Dept. of Economics. BGC
Tutorial Discussion on the Topic	1.00 pm--1.30 pm	Interactive session between Resource person and participants	Prof. Dola Chattopadhyay
Evaluation	1.30 pm –2.15 pm	MCQ questionnaires/ Spot Assignments	Prof. Dola Chattopadhyay
Break	2.15 pm —2.45m		
Sampling Techniques	2.45 pm–3.45pm	**Theory of Sampling and Its Application**	Prof. Debarshi Mondal Associate Professor Dept. of Economics Chandernagore College Govt. of West bengal
Tutorial Discussion on the Topic	3.45 pm –4.15pm	Interactive session between Resource person and	Prof. Debarshi Mondal

		participants	
Evaluation	4.15 pm –5pm	MCQ questionnaires/ Spot Assignments	Prof. Debarshi Mondal

Day 5: 14/06/2023 (Wednesday), Time: 11 am to 5 pm

Topic	Duration	Course Content	Resource Person
Issues on Econophysics	11 am -1.00 pm	**Kinetic Theory model of Income distribution**	Prof. Sudip Mukherjee Assistant Professor Dept. of Physics, BGC
Tutorial Discussion on the Topic	1.00 pm--1.30 pm	Interactive session between Resource person and participants	Prof. Sudip Mukherjee
Evaluation	1.30 pm –2.15 pm	MCQ questionnaires/ Spot Assignments	Prof. Sudip Mukherjee
Break	2.15 pm —2.45m		
The Basics of Panel Data	2.45 pm–3.45pm	**Definition, description and Uses of panel data**	Prof.Puja Biswas HOD & Assistant Professor Prasanta Chandra Mahalanobis Mahavidalaya
Tutorial Discussion on the Topic	3.45 pm –4.15pm	Interactive session between Resource person and participants	Prof.Puja Biswas
Evaluation	4.15 pm –5pm	MCQ questionnaires/ Spot Assignments	Prof. Puja Biswas

Day 6: 16/06/2023 (Friday), Time: 11 am to 5 pm

Topic	Duration	Course Content	Resource Person
Dynamic Economic Fluctuation	11 am -1.00 pm	**Concept of Stochastic Process---a Time series Analysis**	Prof. Kaushiki Banerjee Assistant professor Dept. of Economics. BGC
Tutorial Discussion on the Topic	1.00 pm--1.30 pm	Interactive session between Resource person and participants	Prof. Kaushiki Banerjee
Evaluation	1.30 pm –2.15 pm	MCQ questionnaires/ Spot Assignments	Prof. Kaushiki Banerjee
Break	2.15 pm —2.45m		
Static Economic Fluctuation	2.45 pm –3.45pm	**Measurement of price relatives, construction and application of Indices**	Prof. Kaushiki Banerjee
Tutorial Discussion on the Topic	3.45 pm –4.15pm	Interactive session between Resource person and participants	Prof. Kaushiki Banerjee

Evaluation	4.15 pm –5pm	MCQ questionnaires/ Spot Assignments	Prof. Kaushiki Banerjee

Course Outcome

DAY 1: **05/06/2023**
Topic: **Foundation of Statistics**
Course Content: **Data collection, Central tendency Dispersion, Skewness and Kurtosis**
Instructor: **Prof. Rongili Biswas**

Course Outcome: The students are able to

1) Understand the process of data collection
2) Learn different measures of central tendency and dispersion, the comparative study, the specific use and formulae for calculating these measures
3) Find an estimate of skewness and degree of peakedness of any given distribution
4) Get a preliminary idea of nature of the distribution

DAY 2: **07/06/2023**
Lecture 1
Topic: **Bivariate Data Analysis**
Course Content: **Concept of correlation, Regression, Estimation and Hypothesis testing**
Instructor: **Prof. Dola Chattopadhyay**

Course Outcome: The students are able to

1) Learn the concept of bivariate analysis, specifically focusing on estimating the causal relationship between two variables.
2) Strengthen the visual understanding of the degree and direction of correlation between two variables using graphs.
3) Estimate different correlation coefficients and perform regression analysis.
4) Gather knowledge on formulation and testing of hypothesis based on different statistical criteria.

Lecture 2
Topic: **Introduction to Official Statistics**
Course Content: **Different sources of official statistics in India**
Instructor: **Prof. Kaushiki Banerjee**

Course Outcome:

1) The students learnt the importance of official statistics in conducting most of the empirical research now-a-days and also the brief history of publication of official statistics in India from colonial era.
2) This course provides vivid knowledge to the various sources of secondary data capturing diverse economic phenomenon, viz., production, finance, trade, employment, migration, hygiene, crime, deprivation, and so on, available in public domain both at the state/district level as well as unit level.
3) Through live demonstration, the students have learnt the process of accessing various national reports and database and using these data for their own research.

DAY 3: **09/06/2023**

Lecture 1

Topic: **Concept of probability and distribution**

Course Content: **Classical and Axiomatic concept, Binomial, Poisson, Normal, Uniform, Hypergeometric prob. distribution**

Instructor: **Prof. Rajnarayan Gupta**

Course Outcome: The students are able to

1) Learn the classical and axiomatic definition of probability and also the concept of random variables, estimation of expectation, variance etc. has been taught with solving different problems.
2) Learn in-depth of different theoretical distributions for both discrete and continuous random variables, the nature and property of each distribution and the case when the discrete distribution, like, Binomial or Poisson tends to normal distribution.

Lecture 2

Topic: **Empirical Research and Vital Statistics**

Course Content: **Stages of Empirical Research, Survey Methodology, Different vital statistics**

Instructor **Prof. Anindita Sengupta**

Course Outcome:

1. The students learnt the different stages for carrying out an empirical research.
2. A detailed discussion on method and tools to conduct surveys and representation of data after survey which is amenable for statistical analysis, by detecting outliers has been taught with real life examples.
3. The students have gathered immense knowledge on vital statics method, for e.g., construction of a life table, measurement of mortality, fertility, population growth, morbidity and reproduction rate, and population estimates and projections.

DAY 4: **12/06/2023**

Lecture 1

Topic: **Econometric Analysis**

Course Content: **Classical Linear Regression Model- Bivariate & Multivariate**

Instructor: **Prof. Dola Chattopadhyay**

Course Outcome: The students are able to

1) Learn the classical linear regression model, both for bivariate and multivariate data, and estimate the model using ordinary least squares.
2) Interpret the regression result, test the significance of beta coefficients, estimate the confidence intervals, and perform t-test and F-test for goodness of fit.
3) Learn the analysis of residual in estimation.

Lecture 2

Topic: **Sampling Techniques**

Course Content: **Theory of Sampling and Its Application**

Instructor **Prof. Debarshi Mondal**

Course Outcome:

1) The sampling theory was taught in detail by focusing on key concepts, like, population, sample, parameter and estimate.
2) The students learnt the different sampling technique, probabilistic and

non-probabilistic sampling, the purpose and method of use.

3) Through solving different problems, the students have understood how to fetch random numbers from random number series and use it in case of random sampling both with replacement and without replacement.

DAY 5: **14/06/2023**

Lecture 1

Topic: **Issues on Econophysics**

Course Content: **Kinetic Theory model of Income distribution**

Instructor: **Prof. Sudip Mukherjee**

Course Outcome: The students have learnt

1. The application of different models in Physics in analyzing different economic phenomenon, like, income distribution
2. A brief overview of some models, like DY model, CC model, CCM model has been discussed in understanding income inequality.
3. Use of log-graph for this kind of analysis has been introduced.

Lecture 2

Topic: **The Basics of Panel Data**

Course Content: **Definition, description and Uses of panel data**

Instructor **Prof. Puja Biswas**

Course Outcome:

1. This course introduced the structure, use and construction of panel data emphasizing the growing use of panel data in economic research over cross-section data.
2. Further the definition and formulation of panel and pooled data, long and short panel have been demonstrated.
3. The estimation of panel data and some preliminary tests before estimation has been lucidly explained in brief with the aid of examples.

DAY 6: **16/06/2023**

Lecture 1

Topic: **Dynamic Economic Fluctuation**

Course Content: **Concept of Stochastic Process---a Time series Analysis**

Instructor: **Prof. Kaushiki Banerjee**

Course Outcome:

1) The concept of time-series has been introduced with examples, like, daily, monthly, yearly, quarterly series.
2) Understanding and estimating the different components of time-series (for e.g. estimating trend by linear and non-linear curve fitting) has been discussed.
3) The students have learnt to de-trend and de-seasonalise the stochastic process.
4) The different type of models, like, AR, MA, ARMA etc., and the cocept of trend stationary and difference stationary process, has been described in brief.

5) How the time-series regression helps in forecasting has also been discussed.

Lecture 2

Topic: **Static Economic Fluctuation**

Course Content: **Measurement of price relatives, construction and application of Indices**

Instructor **Prof. Kaushiki Banerjee**

Course Outcome: The students are able to learn

1. Different method of estimating inequality, like, Gini Index, Atkinson index, General Entropy measures, the similarity and dissimilarity between these measures have also been highlighted.
2. The method of selection of components, choice of weights and formula for construction of index, like, Human Poverty Index or Human Development Index with examples.
3. Construction of price index using weighted or exponential moving average.

PHOTO GALLERY

DAY 1: Inaugural Session

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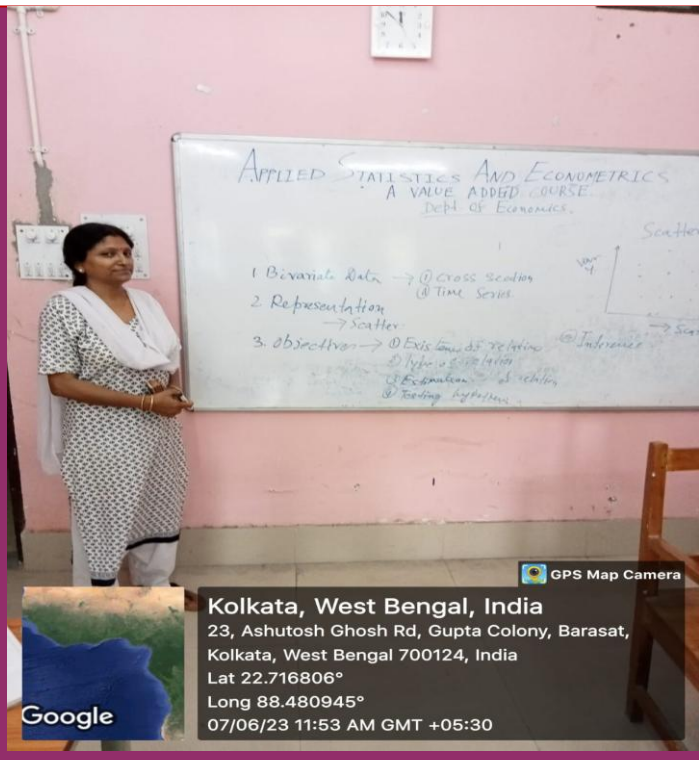
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Dr. Anindita Sengupta
Associate Professor of Economics
Barrackpore Rastraguru Surendranath College
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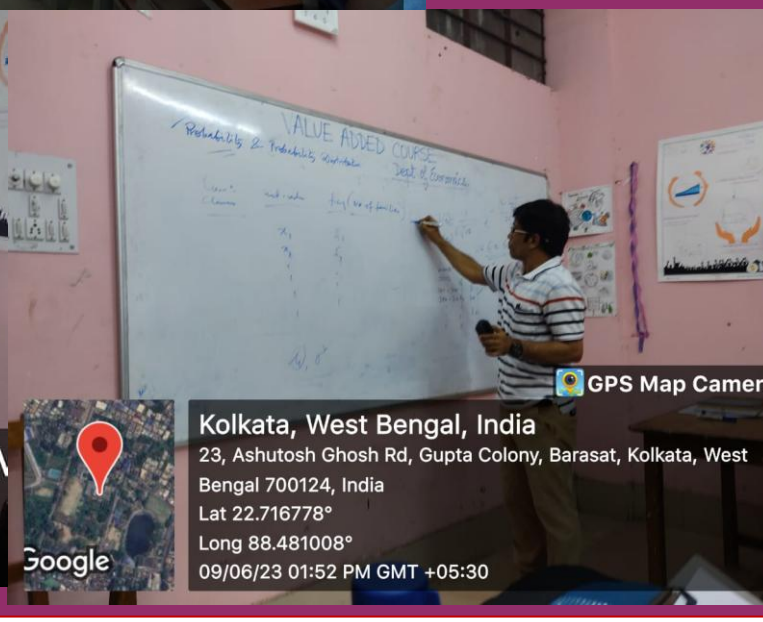
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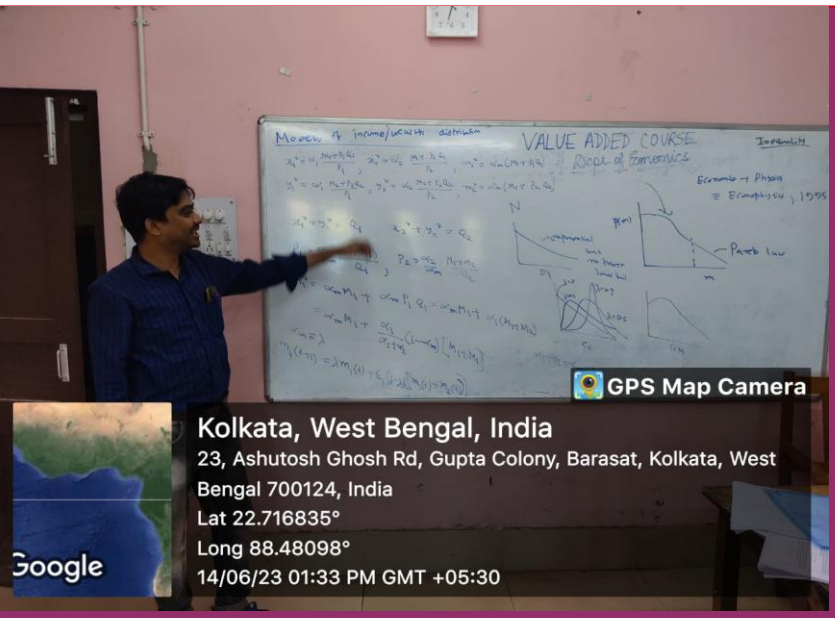
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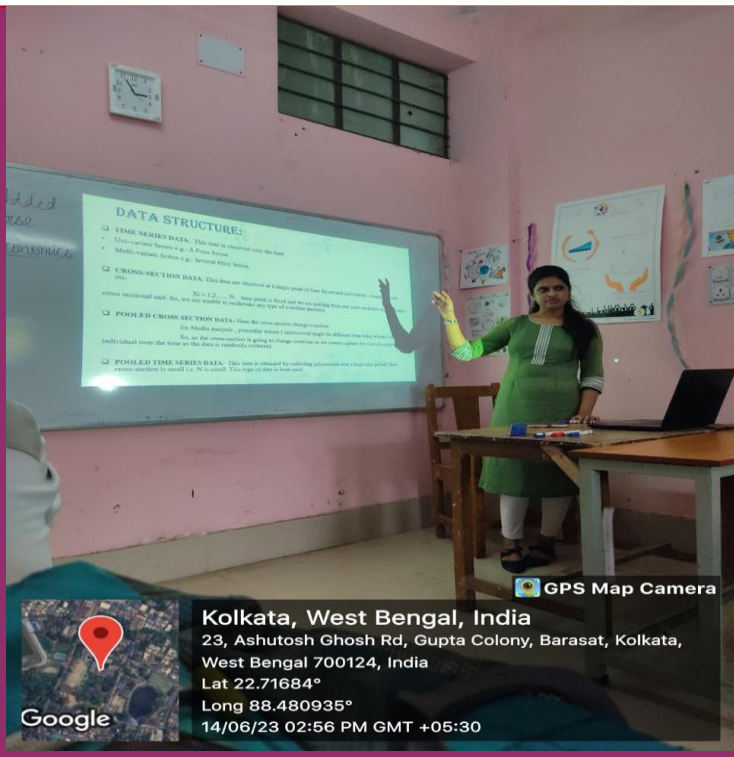
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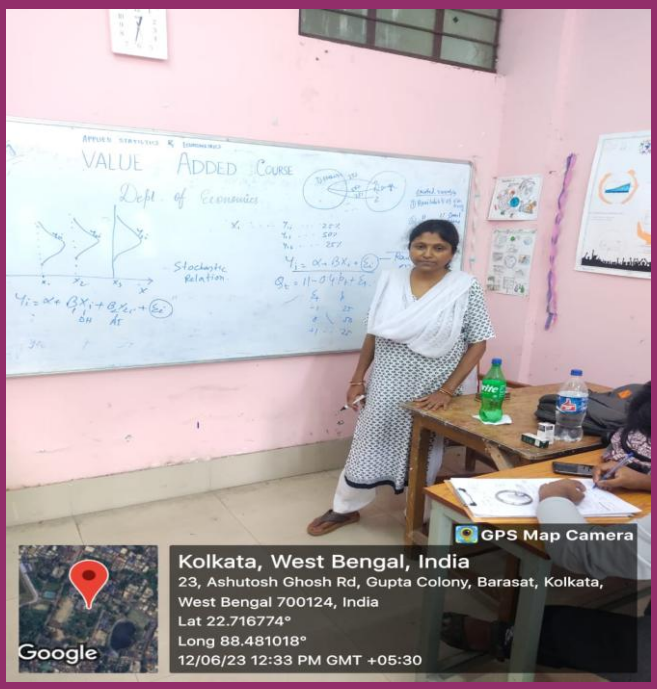
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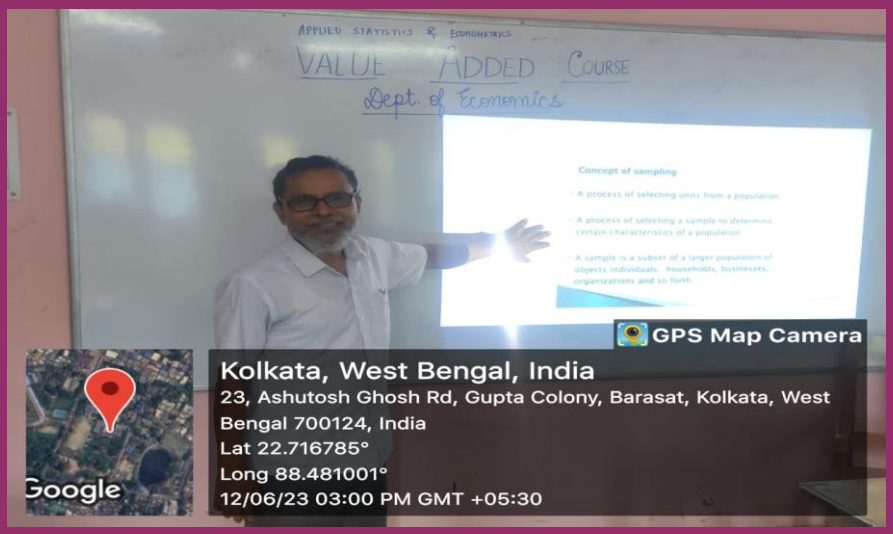
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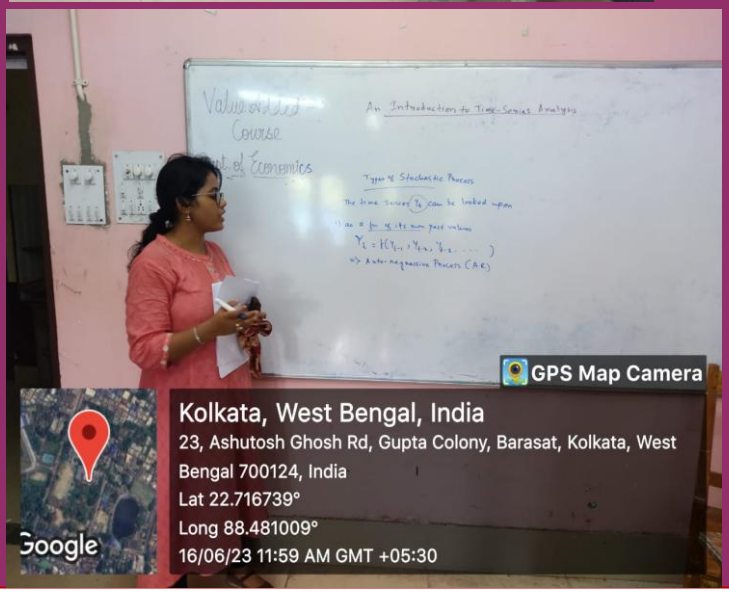
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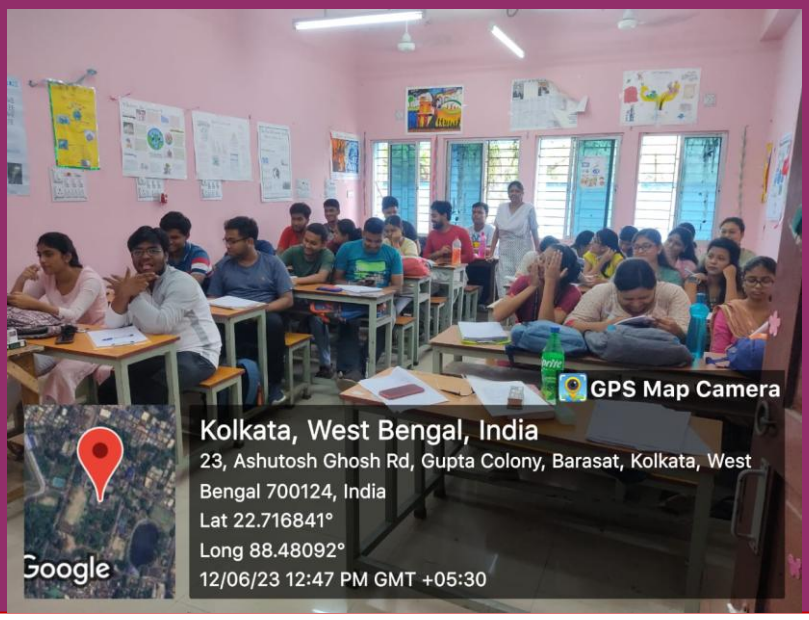
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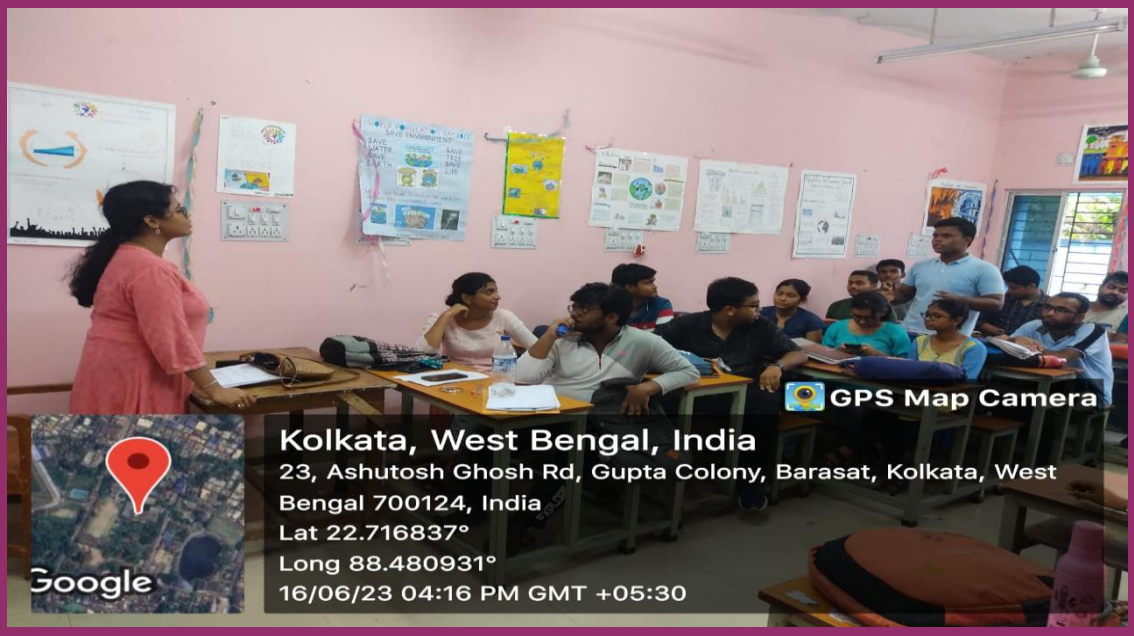
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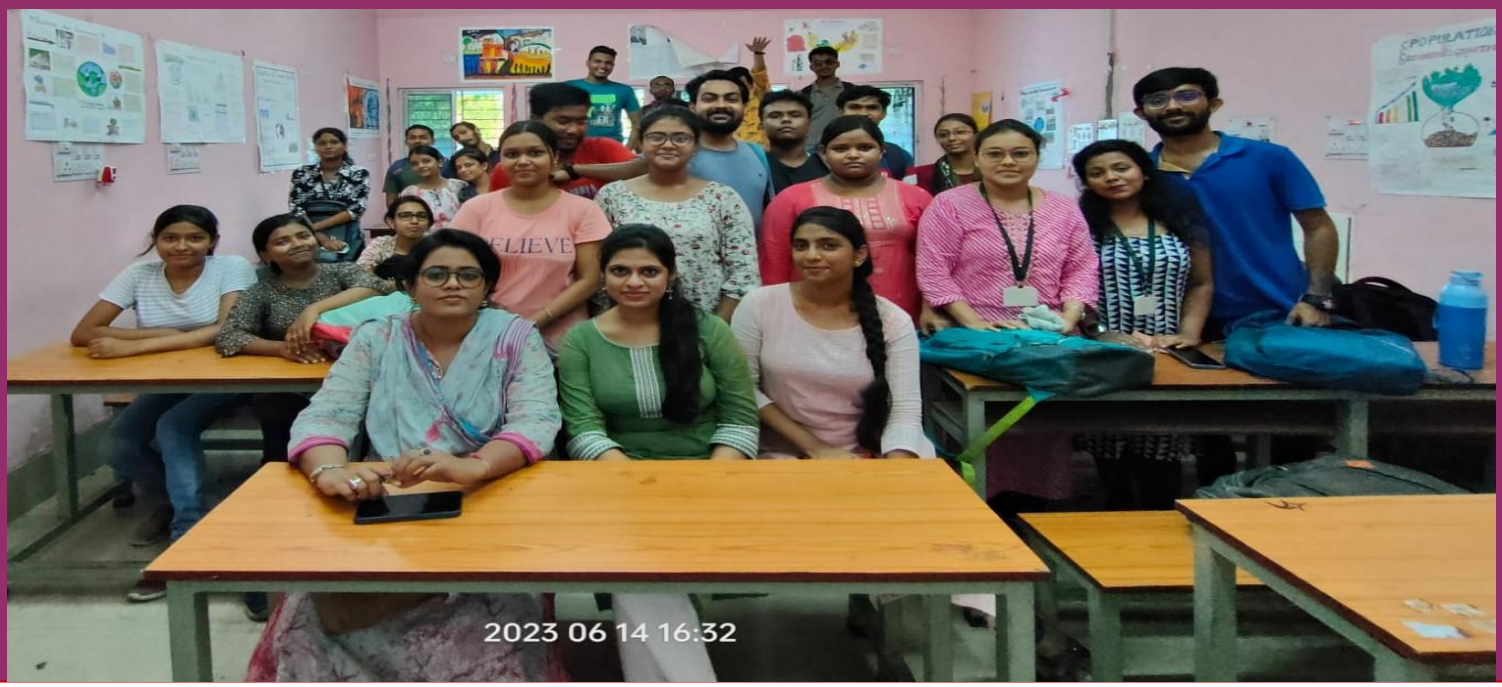
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