Dr. Ambedkar College, Deekshabhoomi, Nagpur
Department of Statistics

Guest Lecture by Mrs. Mamta Dani on
"Application of Statistics in Engineering"
On 19th October, 2021

The Statistical Society of Dr. Ambedkar College organized a guest lecture as a part of its annual programme plan. Mrs. Mamta S. Dani, Asso. Professor, Department of Mathematics, Yeshwantrao Chavan College of Engineering, Nagpur was invited to deliver guest lecture on "Application of Statistics in Engineering". Mrs. A. M. Badar, Head, Department of Statistics heartily welcomed guest followed by introductory remarks and formal introduction of guest.

Mrs. Dani madam started her lecture by giving a world-famous historical example of Florence Nightingale who was not a statistician but she used collected data for drawing meaningful conclusions. When Statistical techniques were not developed Florence concluded that main reason for deaths of army personnel was not war but the unhygienic conditions prevalent in those days by collecting data and analyzing it.

Mrs. Dani mentioned basic uses of Statistics in daily life in fields such as government, weather forecast, emergency preparedness, political campaigns, sports, research, education, prediction, predicting diseases, quality testing, insurance, consumer goods, financial market, business Statistics, transportation, cryptocurrency, tourism etc. She also mentioned advanced uses of Statistics in fields such as computer science, robotics, aerospace, data science, machine learning, deep learning etc.

Next, she explained the applications of Statistics in the following core branches of engineering.

1. Civil Engineering:

- Loss estimation-

- Risk assessment and management-

- Hazard analysis- Probabilistic design- Risk-based optimal design

- Maintenance and inspection- Concrete and wood structures-

  Bridges and special structures-

- Geoengineering- Earthquake engineering- Wind engineering

2. Mechanical Engineering:

- Quality testing.
- Robotics. Statistics has various uses in the field of robotics. Various techniques can be applied in this field, such as EM, Particle filters, Kalman filters, Bayesian networks, and much more.

3. Aerospace:

Statistics is one of the important parameters on which aerospace engineering works.

There are numerous ways in which statistics are easily implemented, such as details about shrinkage and growth rate for a route.

Apart from this, statistics is used to study traffic decline and growth, the number of accidents due to aerospace failures, etc.

Several airline industries use these statistics information to check how they can work to make a better aerospace future

Advanced uses of Statistics.

1. Computer Science:

Statistics is essential for all sections of science, as it is amazingly beneficial for decision making and examining the correctness of the choices that one has made.

With the **application of statistics in computer science** and machine learning, algorithms' efficiency can be increased significantly. One also can reduce the price of processing with the help of statistics.

2. Deep Learning:

Statistics and probability both are considered as the method of handling the aggregation or ignorance of data.

Deep learning can use statistics to get knowledge about abstracting several useful properties and ignorance of the details.

3. Machine Learning:

Statistics is utilized for quantifying the uncertainty of the estimated skills within the machine learning models.

4. Data Science:

A data scientist uses different statistical techniques to study the collected data, such as Classification, Hypothesis testing, Regression, Time series analysis, and much more.

Some of the important functions of statistics are:

To represent the facts from numerical figures.

To help in classification of data, predicting future trends and formulating policies.

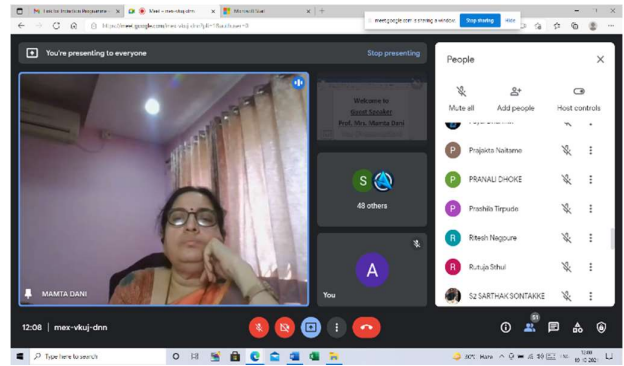To determine the relationship between different phenomena.

To have an idea about occurrences or non-occurrences of certain events and draw valid inferences or conclusions.

Statistics has various engineering applications in testing materials, performance test of systems, robotics and automation in general, control of production process and so on. It has roles in different fields of engineering.
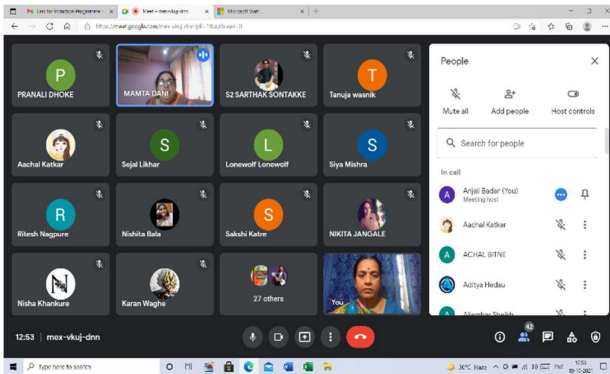
Design of experiments uses statistical techniques to test and construct models of engineering components and systems.
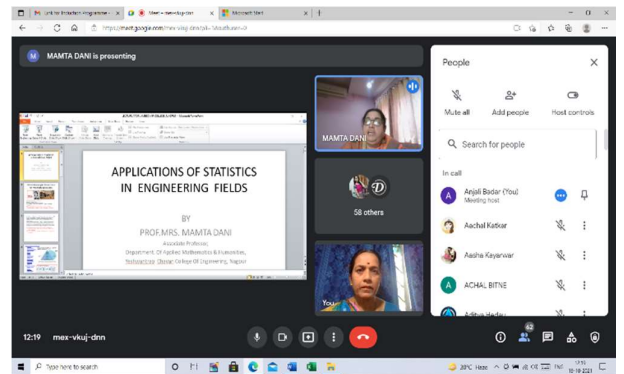

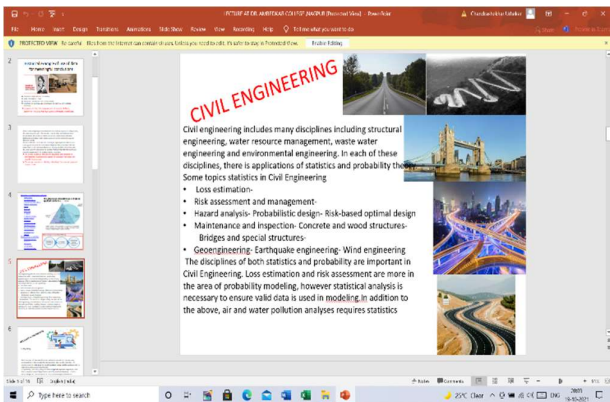HoD welcoming the Guest Speaker
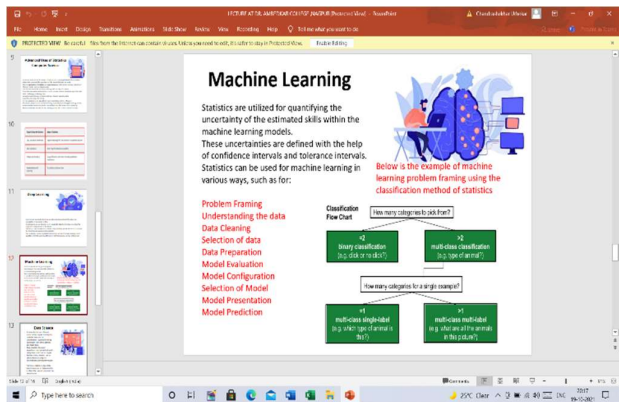

Guest Speaker delivering Lecture

Students attending the online Guest Lecture

Online Guest Lecture in progress.

Application of Statistics in Civil Engg.

Application of Statistics in Machine Learning

Mrs. Dani covered a range of topics in short but in a precise manner keeping the gathering engaged all through her session. The vote of thanks was proposed by Mrs. Anjali Badar, HoD. The programme was well attended and appreciated by nearly 60 students and staff members of Department of Statistics. As per the feedback received from the participants, it was a very good learning experience for them and the lecture helped them in understanding the application of subject in depth.