

**REFRESSOR COURSE
ON
23-SEPTEMBER, 2023 ONWARDS**

**ORGANIZED BY
HUMAN RESOURCE DEVELOPMENT CENTER INTEGRAL UNIVERSITY
IN ASSOCIATION WITH
DEPARTMENT OF MATHEMATICS & STATISTICS**

Brief Report of

The activity commenced with a welcoming speech delivered by **Prof. Mobin Ahmad**, the Head of the Department of Mathematics & Statistics at Integral University in Lucknow. He extended a warm greeting to the Guest, faculty members, and audience of the Day.

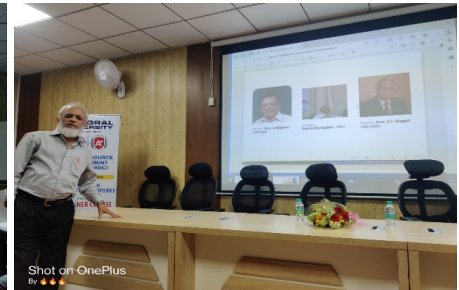
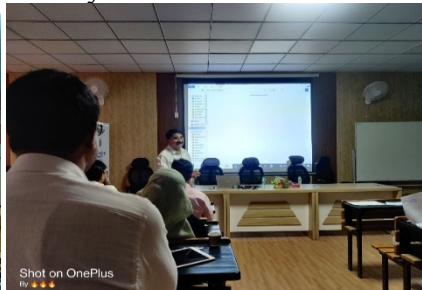
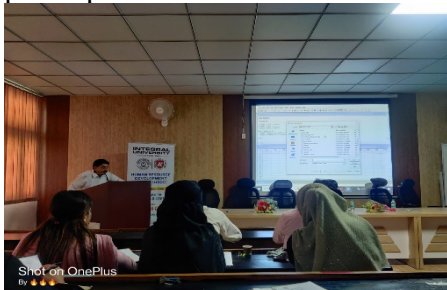
Session I:

The session was led by **Prof Aquil Ahmad**, serves as the Head of the Department of Statistics at Aligarh Muslim University in Aligarh. **Professor Aquil Ahmad** delivered a presentation on "**Exploratory Data Analysis and Regression Diagnostics Using Software Packages.**" He explained the purpose and importance of Software Packages in Data Analysis and Regression Diagnostics. The session also discussed the importance of Data Analysis and Regression Diagnostics in research issues. He provided clear definitions and performed practical exercises using software packages for data analysis and regression diagnostics using Excel.

Session – II:

The session was led by **Prof. Muhammad Hasan Shahid** from the Department of Mathematics of Jamia Millia Islamia, New Delhi. **Professor Shahid** delivered a presentation titled "**A Journey of Geometry of Submanifolds in Last Four Decades.**" He explained the top three geometers and their contributions to the study of submanifolds in the field of geometry over the past forty years. 1. Professor Bejancu, 2. Professor A. Sharfuddin, and 3. Professor Krishna Duggal. The talk also highlighted the geometric properties of slant submanifolds and CR-submanifolds, and their applications in advancing research in previous decades. He presented remarkable discoveries in the field of submanifold geometry that have been made in recent decades.

Dr. Mohmmad Aamir Qayyoom, an Assistant Professor in the Department of Mathematics & Statistics at Integral University in Lucknow, is overseen this activity. All faculty members in the department have participated in the refresher course activity.



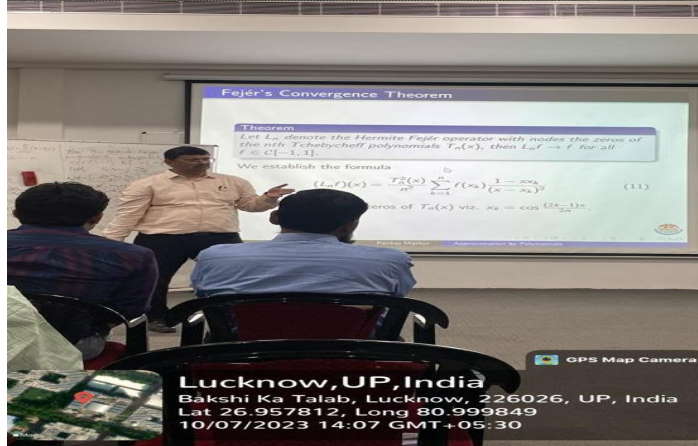
Brief Report of Activity on Approximation by Polynomials

The third activity of the refresher course took place at the Department of Mathematics & Statistics, Integral University, Lucknow on **07-OCTOBER, 2023**. **Prof. Pankaj Mathur, Department of Mathematics and Astronomy, University of Lucknow**, Lucknow conducted a lecture on the topic ‘**Approximation by Polynomials**’

The lecture commenced with a welcoming speech delivered by **Prof. Mobin Ahmad**, the Head of the Department of Mathematics & Statistics at Integral University in Lucknow. He extended a warm greeting to the Guest, faculty members, and audience of the Day.

The Resource Person of the session was **Prof. Pankaj Mathur, Department of Mathematics and Astronomy, University of Lucknow**, Lucknow. Prof. Pankaj Mathur Delivered his talk on the topic “**Approximation by Polynomials**”. He explained the application of Approximation to minimize different types of expressions, He also explained the Fejer’s Convergence theorem and given the brief on modified weighted interpolation. He further discussed about the Interpolation on Mixed Tchebycheff Nodes etc. All the faculty members of the department have participated in the refresher course.

Dr. Sameena Saba, an Assistant Professor in the Department of Mathematics & Statistics at Integral University in Lucknow, is coordinated this activity. All faculty members in the department have participated in the refresher course activity.



Brief Report of Activity on **Theoretical and Numerical Techniques to Solve Differential Equations**

The third activity of the refresher course took place at the Department of Mathematics & Statistics, Integral University, Lucknow on October 14, 2023. **Prof. Beer Singh Bhadhauria** from the **Department of Mathematics at Baba Bhimrao Ambedkar University (BBAU)**, Lucknow conducted a lecture on the topic **‘Theoretical and Numerical Techniques to Solve Differential Equations’**

The lecture commenced with a welcoming speech delivered by **Prof. Mobin Ahmad**, the Head of the Department of Mathematics & Statistics at Integral University in Lucknow. He extended a warm greeting to the Guest, faculty members, and audience of the Day.

In his lecture, **Professor Beer Singh Bhadhauria** elucidated the method of approximation to solve boundary value problems. **Professor Beer Singh** explained the Galerkin method with its properties to solve differential equations. **Professor Beer Singh**, also explained graphically the solution of boundary value problems.

Dr. Najmuddin Ahmad, an Associate Professor in the Department of Mathematics & Statistics at Integral University in Lucknow, is coordinated this activity. Every faculty member in the department has actively engaged in the refresher course activities.



Brief Report of Activity on *A Geometric Approach to Calculus of*

The IV activity of the refresher course was held in the Department of Mathematics & Statistics, Integral University, Lucknow on **October 21, 2023**. The Resource Person, **Prof. Viqar Azam Khan**, Department of Mathematics, Aligarh Muslim University, Aligarh delivered the lecture on the topic '*A Geometric Approach to Calculus of*'.

The lecture was started with the welcome address by **Prof. Mobin Ahmad**, Head, Department of Mathematics & Statistics, Integral University, Lucknow. He welcomed the Guest, faculty members and audience of the Day.

Prof. Viqar Azam Khan, in his lecture, He explained the geometrical interpretation of . He explained the directional derivative of function along angle along with 2-dimensional linear space under linear map. He also explained some examples of partial differentiation with geometrical approach. Prof. Viqar beautifully defined Jacobian matrix and chain rule in with applications in geometry. At last, He arranged a mathematical activity based on the topic.

Dr. Mohmmad Aamir Qayyoom, an Assistant Professor in the Department of Mathematics & Statistics at Integral University in Lucknow, is overseen this activity. All faculty members in the department have participated in the refresher course activity.



Brief Report of Activity on

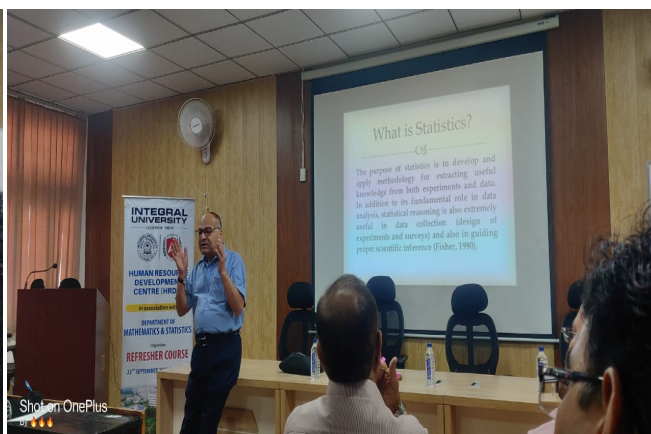
Statistics for Correlation Research

The fifth activity of the refresher course took place at the Department of Mathematics & Statistics, Integral University, Lucknow on October 28, 2023. **Prof. Rajiv Pandey** from the **Department of Statistics at University of Lucknow**, Lucknow conducted a lecture on the topic ‘**Statistics for Correlation Research**’.

The lecture began with a welcoming address from **Prof. Mobin Ahmad**, the Head of the Department of Mathematics & Statistics at Integral University in Lucknow. He extended a warm welcome to the guest, faculty members, and the audience for the day.

In his lecture, **Prof. Rajiv Pandey** provided an in-depth review of essential statistical concepts and techniques for conducting correlational research. **Prof. Rajiv Pandey** also discussed real-world applications of correlation research, highlighting its relevance in fields such as healthcare, economics, and social sciences.

Dr. Ummey Habiba, an Assistant Professor in the Department of Mathematics & Statistics at Integral University in Lucknow, is coordinated this activity. Throughout the course, faculty members engaged in hands on exercises to practice calculating correlation coefficients, coefficient of determination.





Brief Report of Activity on *Statistical Thinking*

The VI lecture of the refresher course was held in the Department of Mathematics & Statistics, Integral University, Lucknow on **11-11-2023**. The Resource Person, **Prof. Neeraj Mishra**, Department of Mathematics & Statistics, IIT, Kanpur delivered the lecture on the topic '*Statistical Thinking*'.

The lecture was started with the welcome address by **Prof. Mobin Ahmad**, Head, Department of Mathematics & Statistics, Integral University, Lucknow. He welcomed the Guest, faculty members and audience of the Day. He expressed his views to motivate the audience having opportunity to be the well equipped with statistical thinking in real life situations.

Prof. Mishra, in his lecture, highlighted the importance of Statistical Thinking in our day-to-day life. He emphasized that the Statistical thinking is a better way to understand reality and approaches to process information through the lens of probability and statistics to make informed decisions. Making choices is a part of our daily lives, be it personal or professional. If you apply statistical thinking wherever possible, you can make better choices. **Statistical thinking** is not just about using formulas to calculate p-values and z-scores; it's a way to think about the world. Once you internalize this idea, it will change how you see the world. You'll start thinking in terms of probabilities instead of certainties, which will help you make better decisions in your professional and personal life.

He categorically explained the Simpson's Paradox and Random walk process. He also underlined, *Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write.*

The program ended with the vote of thanks delivered by **Dr. Quazzafi Rabbani**, Associate Professor, Department of Mathematics & Statistics, Integral University, Lucknow. He expressed his sincere thanks and gratitude to the resource person, audience and organizing committee of the lecture.



Brief Report of Activity on

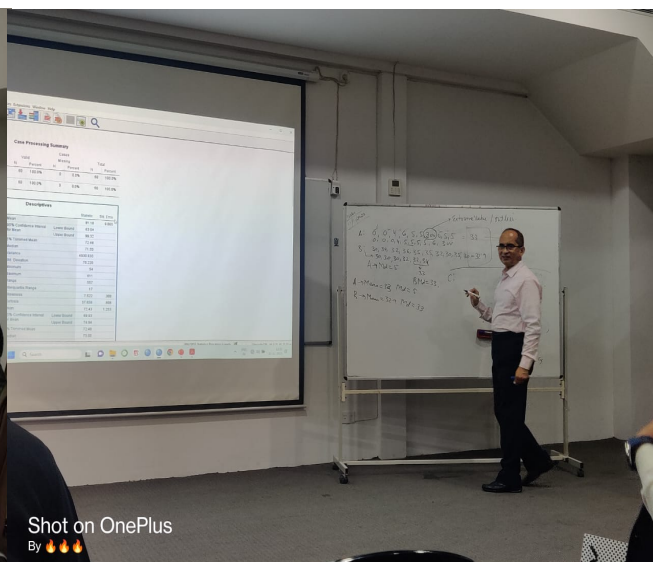
Statistical Data Analysis using SPSS

The seventh activity of the refresher course took place at the Department of Mathematics & Statistics, Integral University, Lucknow on November 11, 2023. **Prof. Masood Husain Siddiqui** from the **Department of Statistics at University of Lucknow**, Lucknow conducted a lecture on the topic ‘**Statistical Data Analysis using SPSS**’.

The lecture began with a welcoming address from Prof. Mobin Ahmad, the Head of the Department of Mathematics & Statistics at Integral University in Lucknow. He extended a warm welcome to the guest, faculty members, and the audience for the day.

In his lecture, **Prof. Masood Husain Siddiqui**, focusing on the utilization of SPSS, was a comprehensive program designed to revisit and reinforce key concepts in statistical analysis. The objective was to enhance participants’ proficiency in navigating SPSS software and applying statistical methods to analyze and interpret data effectively.

Dr. Ummey Habiba, an Assistant Professor in the Department of Mathematics & Statistics at Integral University in Lucknow, is coordinated this activity. Throughout the course, faculty members engaged in Hands-on exercises involved calculating means, medians, and standard deviations using SPSS.



Brief Report of Activity on

Number Theory and its Applications in Public-Key Cryptography

The seventh activity of the refresher course took place at the Department of Mathematics & Statistics, Integral University, Lucknow on **November 25, 2023**. **Dr. Anand Ballabh Joshi, Department of Mathematics & Astronomy, University of Lucknow, Lucknow**, Lucknow conducted a lecture on the topic '**Number Theory and its Applications in Public-Key Cryptography**'.

The lecture began with a welcoming address from **Prof. Mobin Ahmad**, the Head of the Department of Mathematics & Statistics at Integral University in Lucknow. He extended a warm welcome to the guest, faculty members, and the audience for the day.

The Resource person of the session was **Dr. Anand Ballabh Joshi, Department of Mathematics & Astronomy, University of Lucknow, Lucknow**. Dr. Anand Ballabh Joshi delivered his talk on the topic "**Number Theory and its Applications in Public-Key Cryptography**". He explained the importance of numbers in our life. Going through the various aspects of cryptography, namely, secure communication, encryption, decryption, attacks, he described the importance of symmetric and asymmetric cryptography. He also described the most important asymmetric key cipher "RSA" algorithm, used to secure websites, bank transactions, SSL, etc. At the end of his

talk, he discussed about Quadratic Residues and Quadratic Non-Residues, by giving different types of examples. All the faculty members of the department have participated in the refresher course. Some pics of the session can be seen below.

Dr. Abdul Gaffar, an Assistant Professor in the Department of Mathematics & Statistics at Integral University in Lucknow, is coordinated this activity. Throughout the course, faculty members engaged in Hands-on exercises involved calculating means, medians, and standard deviations using SPSS.



Brief Report of Activity on

Applications of Vectors (A Geometric Approach): Geometry and Calculus

The ninth activity of the refresher course took place at the Department of Mathematics & Statistics, Integral University, Lucknow on December 02, 2023. **Prof. Siraj Uddin from the Department of Mathematics at Jamia Millia Islamia** conducted a lecture on the topic ‘**Applications of Vectors (A Geometric Approach): Geometry and Calculus**’

The lecture commenced with a welcoming speech delivered by **Prof. Mobin Ahmad**, the Head of the Department of Mathematics & Statistics at Integral University in Lucknow. He extended a warm greeting to the Guest, faculty members, and audience of the Day.

In his lecture, **Professor Siraj Uddin** elucidated the geometric interpretation of vector functions. **Professor Siraj** provided background of the geometry of slant submanifolds with recent discoveries in slant submanifolds. Prof. Siraj, also explained warped product submanifolds in metallic Riemannian manifolds. Finally, he organized a mathematical activity centered around the chosen

topic.

Dr. Mohammad Aamir Qayyoom, an Assistant Professor in the Department of Mathematics & Statistics at Integral University in Lucknow, is coordinated this activity. Every faculty member in the department has actively engaged in the refresher course activities.



Brief Report of Activity on **Linear Error-Correcting Codes**

The lecture commenced with a welcoming speech delivered by **Prof. Mobin Ahmad**, the Head of the Department of Mathematics & Statistics at Integral University in Lucknow. He extended a warm greeting to the Guest, faculty members, and audience of the Day.

The session was conducted by **Prof Nadeem ur Rehman**, Department of Mathematics at Aligarh Muslim University, Aligarh. Professor Nadeem presented a lecture on the subject of "**Linear Error-Correcting Codes**" on **December 09, 2023**. He elucidated the use and significance of Coding theory in the efficacious transmission of data across a channel with noise, as well as the rectification of faults in compromised communications. The presentation also addressed the significance of algebra, combinatorics, and geometry in coding theory, highlighting its utilisation in the development of coding theory and the derivation of profound mathematical outcomes. He clarified that Error-correcting codes focus on enhancing communication reliability in the presence of noise in channels. They have diverse applications, such as transmitting images from remote space, ensuring sound quality in CDs, telephone lines, computer networks, wireless communication, and assigning ISBN numbers.

Dr. Malik Rashid Jamal, an Assistant Professor in the Department of Mathematics & Statistics at Integral University in Lucknow, is coordinated this session. Every faculty member in the department has taken part in the session of refresher course.

