



E-NEWSLETTER

STATISTICS DEPARTMENT

LCWU

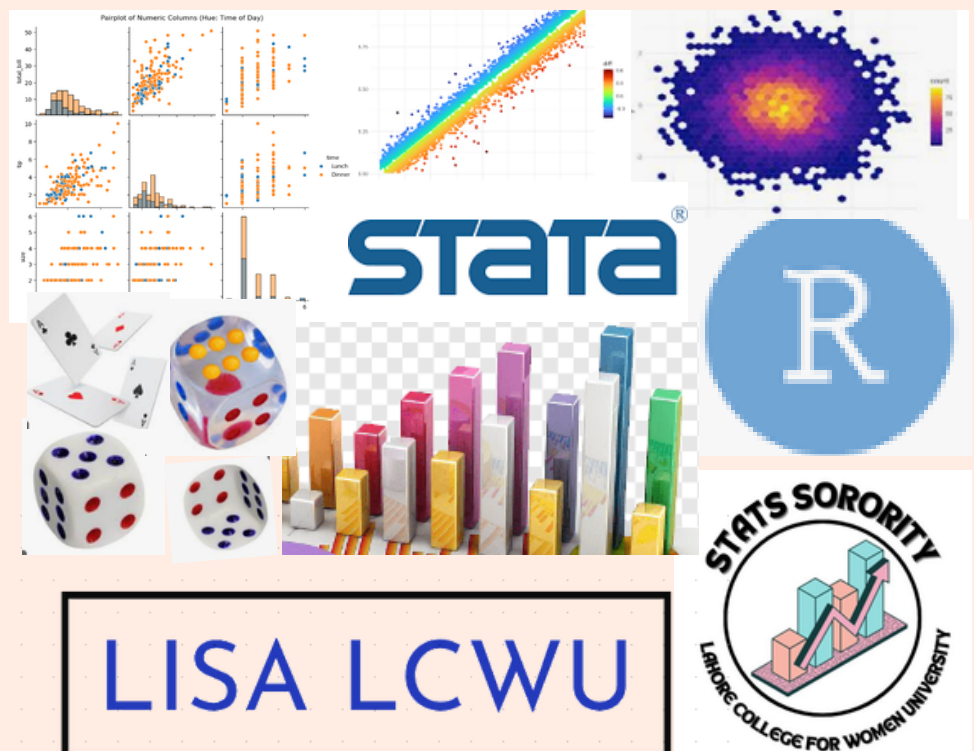
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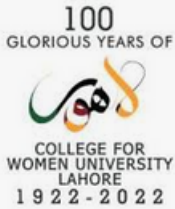
“Facts are Stubborn, But Statistics are More Pliable”

By Mark Twain





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E-NEWSLETTER, STATISTICS DEPARTMENT LCWU NEWS

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VICE CHANCELLOR'S MESSAGE

The Department of Statistics is one of the oldest departments of LCWU, has consistently made remarkable strides in advancing academic excellence. Over the years, it fostering a dynamic learning environment for students and equipping them with essential statistical tools to address complex challenges across various areas. With a strong focus on interdisciplinary research, the department has successfully collaborated with other fields such as economics, health sciences, and social sciences, contributing significantly to the development of data-driven solutions.

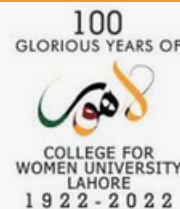


The Department of Statistics has established strong collaborations at International Level. These partnerships provide students and faculty with valuable opportunities to learn best practices and gain practical experience to address contemporary challenges using statistical methods. I would specially appreciate Dr. Asifa Kamal, Chairperson, Department of Statistics, for her unwavering dedication to the growth and development of the department that has been a cornerstone of its success. Through a vision grounded in academic excellence and innovation, she has consistently inspired both faculty and students to reach new heights.

Prof. Dr. Uzma Quraishi
Vice Chancellor LCWU



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DIRECTOR AWARD OF EXCELLENCE 2024 IN GLOBAL LISA NETWORK

Dr. Asifa Kamal, Chairperson, Department of Statistics, Lahore College for Women University (LCWU), Lahore won the Director Award of Excellence 2024 in Laboratory for Interdisciplinary Statistical Association (LISA) Global Network. Dr. Asifa Kamal as coordinator of Statistics lab at LCWU organized numerous trainings, workshops, seminars and webinars for researchers with a goal to improve the quality of statistics and data science applied to advance high-impact research.

The Laboratory for Interdisciplinary Statistical Analysis, Lahore College for Women University (LISA-LCWU) was established as a transitional member of LISA 2020 project of University of Colorado Boulder, USA, global network on 12th February 2020. Dr. Kamal has been granted with full membership of the LISA 2020 network. The aim of LISA 2020 is to build capacity in statistics and data-science in developing countries by creating a robust network of laboratories of collaboration called "stat labs".

GLOBAL HORIZONS: FACULTY MEMBER'S ENRICHING INTERNATIONAL EXPERIENCE

Dr. Naila Amjad, Assistant Professor, Department of Statistics, LCWU completed her post-doc from University of Waterloo, Canada and returned in July 2024 to LCWU. She has brought her valuable international experience in teaching and research, enriching the academic environment with diverse perspectives and innovative approaches. Her global insights have contributed to fostering cross-cultural collaboration and advancing research excellence.

Dr. Sadia Khalil, Assistant Professor in the Department of Statistics at LCWU, served as a Visiting Assistant Professor (VAP) of Statistics at the University of North Carolina Greensboro (UNCG), USA, from August 2022 to July 2024. Throughout her tenure, she gained invaluable international experience in teaching, research, and service. Dr. Khalil received an "Exceeds Expectations" rating on both annual performance reviews during her time at UNCG. She returned to LCWU in July 2024, bringing with her enhanced expertise and global perspectives.



E-NEWSLETTER, STATISTICS DEPARTMENT LCWU ACHIEVEMENTS

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OUR ALUMNI: BEST EMPLOYEE AWARD 2024

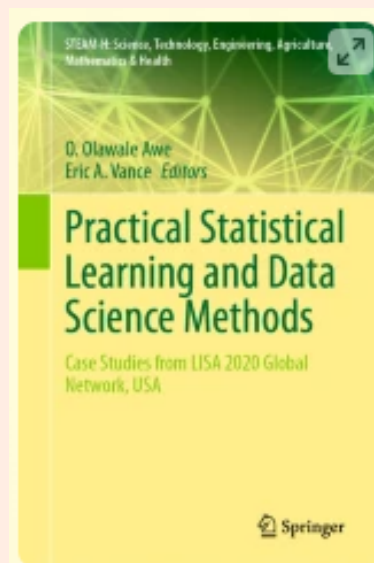
Dr. Ayesha Iftikhar, alumna, Department of Statistics, LCWU is awarded with the prestigious Best Employee Award at Lahore Business School, recognizing exceptional contributions to academic excellence, leadership, and innovation. She is currently serving as Assistant Professor, Head Data Analytics, Subject Coordinator, Lahore Business School, The University of Lahore. With over a decade of experience in academia, She has taught and mentored undergraduate and postgraduate students in subjects like data analytics, business statistics, and quantitative research methods.



BOOK PUBLISHED "PRACTICAL STATISTICAL LEARNING AND DATA SCIENCE METHODS"

Dr. Asifa Kamal Chairperson, Department of Statistics, Lahore College for Women University (LCWU) got her research "Comprehensive Review of Machine Learning Applications on the DHS Dataset Across Multiple Countries" published as a Book Chapter in Practical Statistical Learning and Data Science Methods with co-authors Noor Shahid, Jiya Amir, Lecturer, Department of Statistics, LCWU and Syeda Aroob Shah, Alumna, LCWU. Prof. O.Olawale Awe and Prof. Eric A. Vance were the editors of this volume. O. Olawale Awe holds a PhD in Statistics from the University of Ibadan, Nigeria, and an MBA from Obafemi Awolowo University, Ile-Ife, Nigeria. Eric A. Vance is an Associate Professor of Applied Mathematics and the Director of

the Laboratory for Interdisciplinary Statistical Analysis (LISA) at the University of Colorado Boulder, USA. He is the Director of the LISA 2020 Global Network. This book is published as a part of book series STEAM-H: Science, Technology, Engineering, Agriculture, Mathematics & Health (STEAM) under Springer. In this chapter, application of wide range of machine learning (ML) algorithms was studied using varied health indicators from Demographic and Health Survey Dataset from countries like Pakistan, Bangladesh, Indonesia, Ethiopia, and others.





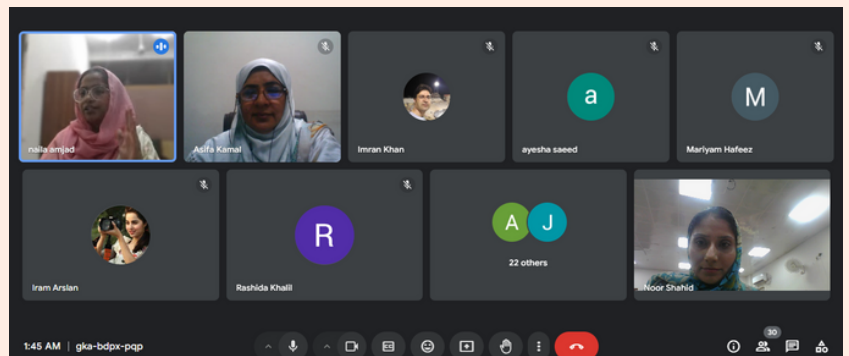
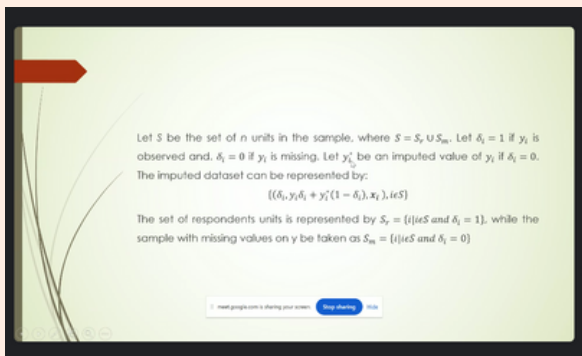
E-NEWSLETTER, STATISTICS DEPARTMENT LCWU WEBINAR

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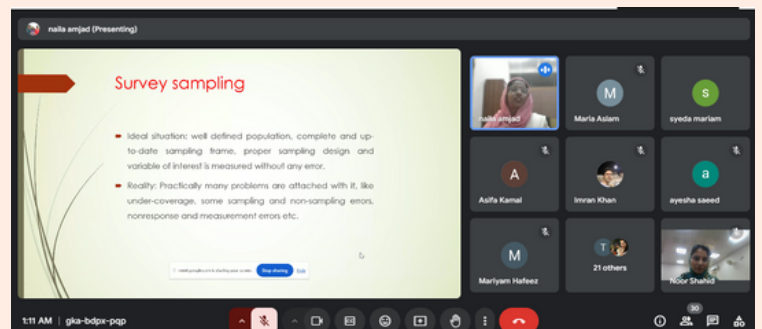
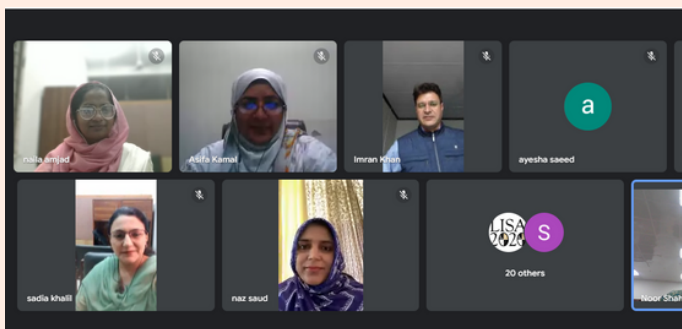
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WEBINAR ON "IMPUTATION APPROACH TO MISSING DATA: A REVIEW"

A successful webinar titled "Imputation Approach to Missing Data: A Review" was organized by the Laboratory for Interdisciplinary Statistical Analysis (LISA-LCWU) in collaboration with Department of Statistics, Lahore College for Women University (LCWU) on October 29, 2024. Dr. Naila Amjad, Assistant Professor, Department of Statistics, LCWU was the guest speaker. The webinar addressed the critical area of research, underscoring the basic and modern statistical imputation techniques to handle missing data.




She also highlighted the significance of the imputation strategies for advanced research. Both National participants from LCWU and International participants from Global LISA network 2020 along with doctorate/post-doctorate research scholars attended the webinar. The familiarity with such methods enables researchers to manage data gaps effectively and ensures robust statistical analysis. Dr. Asifa Kamal, Chairperson, Department of Statistics, LCWU warmly welcomed the speaker and participants and acknowledged Dr. Naila Amjad for sharing her expertise on imputation approaches.





E-NEWSLETTER, STATISTICS DEPARTMENT LCWU WEBINAR

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WEBINAR ON "STEIN'S METHOD FOR DISTRIBUTIONAL COMPARISON"

An informative webinar titled "Stein's Method for Distributional Comparison" was organized on November 21, 2024. The guest speaker was Ms. Anum Fatima, Lecturer, Department of Statistics, LCWU and currently a PhD Scholar at University of Oxford, United Kingdom.

Both National participants from LCWU and International participants from the Global LISA Network 2020, along with doctorate and postdoctoral research scholars, attended the webinar. The speaker shared her profound insights into Stein's method, offering both theoretical depth and practical applications of this



advanced statistical tool. In distribution theory, this method holds significant importance as it provides a rigorous framework to assess the closeness of probability distributions through explicit error bounds.

Approximating a GPE Distribution

For $W \sim PE(\theta_1, \lambda_1)$ and $X \sim GPE(\theta_2, \lambda_2, \beta)$ with $\beta \geq 1$, $h: \mathbb{R}_{>0}^+ \rightarrow \mathbb{R}$, bounded, with $\tilde{h}(x) = h(x) - \mathbb{E}h(W)$, and for $\lambda_1 \leq \lambda_2$

$$|\mathbb{E}h(X) - \mathbb{E}h(W)| \leq \|h\| \left\{ \frac{\lambda_2}{\lambda_1} \beta - 1 \right\} + \left| \frac{\lambda_2 \theta_2}{\lambda_1 \theta_1} \beta - 1 \right| + \left(\frac{\lambda_2}{\lambda_1} - 1 \right) (\lambda_1 \mathbb{E}X + 2),$$

where, for $\beta \geq 1$

$$\mathbb{E}X \leq \frac{\beta \theta}{\lambda(1 - e^{-\theta})\beta}.$$

The session concluded with a heartfelt note of thanks from Dr. Asifa Kamal, Chairperson, Department of Statistics. She praised the insightful discussion on this topic and its prospective application in future research work and acknowledged Ms. Anum Fatima for sharing her expertise.

Stein Operator and a Stein Equation

A Stein operator, say $Tf(x)$, characterizes the target distribution, such that for all $f \in \mathcal{F}(T)$

$$\mathbb{E}[f(X)Tf(X)] = 0 \iff Z \sim \mathcal{L}_0,$$

gives a Stein equation

$$h(x) - \mathbb{E}h(Z) = Tf(x),$$

with the solution given by


$$f(x) = \frac{1}{p(x)} \int_0^x [h(t) - \mathbb{E}h(Z)] p(t) dt = -\frac{1}{p(x)} \int_x^\infty [h(t) - \mathbb{E}h(Z)] p(t) dt.$$

Hence for any random X ,

$$\mathbb{E}h(X) - \mathbb{E}h(Z) = \mathbb{E}Tf(X).$$



E-NEWSLETTER, STATISTICS DEPARTMENT LCWU PARTICIPATION IN EXTERNAL EVENTS

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INTERNATIONAL CONFERENCE ON ADVANCES IN INTERDISCIPLINARY STATISTICS AND COMBINATORICS (AISC-2024)

Dr. Sadia Khalil, Assistant Professor, Department of Statistics, LCWU organized and chaired a session on Randomized Response Models and delivered a research presentation at the International Conference on Advances in Interdisciplinary Statistics and Combinatorics (AISC-2024) held at UNC Greensboro USA on October 11-13, 2024. The International Conference on Advances in Interdisciplinary Statistics and Combinatorics (AISC) includes special sessions on a wide range of current topics, including Causal Inference, Experimental Design, Survey Sampling, High Dimensional Data Analysis, Distribution Theory, Big Data, Survival Analysis, Data Science, Time Series and Statistical Consulting. Her contributions enhance the department's global recognition and strengthen its academic offerings. This international exposure reflects her commitment to advancing the field of Statistics. The department is proud to benefit from her enriched experience.

WORKSHOP BY PROF. DR. MCNEIL ON HYBRID LINEAR MODELS AND AI

Dr. Naila Amjad and Ms. Rashida Khalil, both Assistant Professors at Department of Statistics, LCWU attended a workshop by Prof. Dr. McNeil on Hybrid Linear Models and AI at Kinnaird College University on October, 26, 2024.




BERNOULLI-IMS 11TH WORLD CONFERENCE IN PROBABILITY AND STATISTICS

Ms. Anum Fatima, lecturer, Department of Statistics, LCWU and currently a PhD scholar at the University of Oxford, United Kingdom gave a talk on “Assessing the fit of Erdos-Renyi Mixture Models” at a conference on Bernoulli-IMS 11th World Conference in Probability and Statistics on August 12-16, 2024, at Bochum, Germany.



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CONFERENCE ON "PATHWAY TO SUSTAINABLE DEVELOPMENT: NAVIGATING POPULATION GROWTH, POVERTY, PRODUCTIVITY AND CLIMATE CHANGE"

Dr. Asifa Kamal, Chairperson, Department of Statistics, LCWU attended 25th Annual Population Research Conference (APRC) "Pathway to Sustainable Development: Navigating Population Growth, Poverty, Productivity and Climate Change" on 4-5th December, 2024 at Institute of Business



Administration (IBA) Karachi, Pakistan. The conference was hosted by Population Association of Pakistan in collaboration with IBA. Dr. Kamal was sponsored by the Population Association of Pakistan to deliver her insightful talk titled "Unmasking Geospatial Patterns and Predictive Insights of Healthcare Access Barriers Among Women in Pakistan: A Spatial Analysis and Machine Learning Approaches". Pakistan's population dynamics present both opportunities and challenges for sustainable development. The consequences of this growth are impacting sectors like healthcare, education, employment, and resource management. Dr. Kamal, in line with the population dynamics and productivity improvement efforts, presented her research focused on addressing barriers to healthcare access.

GGCW GULBERG A.S.H. CONFERENCE 2024: CONFRONTING 21ST CENTURY CHALLENGES IN ARTS, HUMANITIES & SCIENCES


A Three-day conference at Government Gulberg College for Women (GGCW) was held on Confronting 21st Century Challenges in Arts, Humanities & Sciences from 30th Oct, 2024 to 1st Nov, 2024. Ms. Jiya Amir, Lecturer, Department of Statistics along with Faiza Jabeen, Syeda Fatima Naqvi -Students at Department of Statistics- LCWU gave

presentation on versatile research topics. Dr. Asifa Kamal, Chairperson, Department of Statistics, Dr. Moneeba Iftikhar, Assistant Professor, Department of Mass Communication, LCWU chaired the conference session along with Dr. Mahnaz Makhdom, Associate Professor, GGCW being the moderator.





E-NEWSLETTER, STATISTICS DEPARTMENT LCWU SEMINAR & QUIZ COMPETITION

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SEMINAR ON "UNLOCKING INSIGHTS: HOW STATISTICS DRIVES SUCCESSFUL RESEARCH"

The Department of Statistics, LCWU, organized a one-day seminar on "Unlocking Insights: How Statistics Drives Successful Research" in collaboration with Laboratory for Interdisciplinary Statistical Analysis (LISA-LCWU) on 16th December, 2024. Dr. Seyab Yasin, Assistant Professor, Department of Economics and Quantitative Methods, Dr. Hasan Murad School of Management, UMT, Lahore, shared the application of statistical techniques in qualitative and quantitative research. With extensive knowledge in research, she guided participants that how various statistical

methodologies lead to successful research. The seminar aimed to equip students and faculty with effective research methods tailored under statistical tools.



QUIZ COMPETITION TO CELEBRATE "INTERNATIONAL DAY OF WOMEN IN STATISTICS AND DATA SCIENCE"

To commemorate World Statistics Day, the Statistics Department at Lahore College for Women University (LCWU) hosted an engaging quiz competition on November 12, 2024. The event was designed to encourage collaborative learning, critical thinking, and problem-solving skills. Four teams, comprising students from BS-III and BS-IV, participated in the competition, which consisted of three rounds of questioning on

general knowledge and statistics. Dr. Asifa Kamal, Chairperson of the Statistics Department, thanked the Statistics Sorority for organizing the successful event and congratulated the students who participated in the quiz, especially the winning team. Team BLUE from BS-III emerged victorious, showcasing their exceptional knowledge and teamwork skills. This event reflects the department's commitment to fostering a culture of academic excellence, teamwork, and intellectual curiosity.





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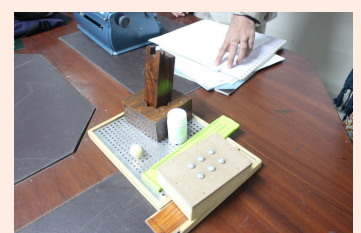
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"A STEP AHEAD TOWARDS DIVERSITY AND INCLUSIVITY: TRAINING TO TEACH QUANTITATIVE REASONING I & II TO VISUALLY IMPAIRED STUDENTS"

The five-day training program titled as "A Step Ahead Towards Diversity and Inclusivity: Training to Teach Quantitative Reasoning I & II to Visually Impaired Students" was organized by the Department of Statistics, Lahore College for Women University (LCWU), from 9th to 13th December 2024, in collaboration with the Laboratory for Interdisciplinary Statistical Analysis (LISA-LCWU) and Aziz Jehan Begum Trust. This initiative was funded by the Elsevier 2023 Mathematical Sciences Sponsorship Fund (MSSF) and held under the kind patronage of Prof. Dr. Uzma Quraishi, Vice Chancellor, LCWU.



Mr. Muhammad Faisal Ali, a special education teacher specializing in teaching visually impaired students, led the program. With extensive experience in teaching Braille and innovative methodologies for visually impaired education, Mr. Faisal guided participants through various strategies for teaching Quantitative Reasoning I & II to visually impaired students. His dedication to inclusivity and hands-on approach significantly enriched the learning experience.





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The five-day training program aimed to equip participants with effective teaching strategies tailored to the needs of visually impaired students. The sessions include the understanding of Braille and its applications in teaching quantitative concepts. Blind students at LCWU, faculty from the Department of Statistics, Mathematics, and from affiliated colleges attended the training. Participants gained practical insights into teaching methodologies and the use of assistive technologies to enhance learning outcomes.



The closing ceremony was honored by the presence of Prof. Dr. Zohra Nazir Kayani (Director, DFDI), Ms. Rizwana Kausar and Ms. Fauzia from Aziz Jehan Begum Trust, Dr. Maria Hussain (Chairperson of Mathematics Dept, LCWU), Dr. Mahnaz Makhdum (Head of Statistics Dept, Govt. College Gulberg), Ms. Uzma Nauman (Head of Statistics Dept, Govt. College Samanabad), and Ms. Sadia Iqbal from Independent Living Centre, LCWU. Certificates were distributed to the participants and organizers. In addition to that, a souvenir and bouquet as a token of appreciation were given to the resource person by Dr. Asifa Kamal (Chairperson, Department of Statistics & Principal Investigator), Dr. Mariyam Hafeez (Co-Principal Investigator), and Prof. Dr. Zohra Nazir Kayani (Director, DFDI). We extend our deepest gratitude to Elsevier 2023 Mathematical

Sciences Sponsorship Fund (MSSF) for their generous support in funding this training. Heartfelt thanks to LISA-LCWU and Aziz Jehan Begum Trust for their excellent organization and execution of this program, and to Prof. Dr. Uzma Quraishi for her invaluable support and leadership.

