

ABOUT NIRWAN UNIVERSITY JAIPUR

Nirwan University, Jaipur was established by the Govt. of Rajasthan vide ACT No. 2 of 2017 and recognized U/s 2 (f) of UGC ACT 1956. The University has been empowered to award degrees under section 22 of UGC Act. NUJ has thirteen different faculties with seventeen schools. The University provides guidance and knowledge to the students in more than seventy programs ensuring high quality traditional and modern education. The University is situated in Jaipur, the capital of Rajasthan. NUJ is a successful venture of "NIRWAN CHARITABLE TRUST" and is one of the prominent choices for higher education among the students.

ABOUT THE BOOK

Preservation of the environment is a major global challenge. This refers to various related concerns that have an impact on the surrounding environment. It is admirable that the variety of materials, methods, and technologies that have been implemented seem to be effective in preserving the environment from toxic pollutants. The present book entitled "Emerging Trends in Environmental Preservation" covers every significant and current environmental issue with precise information presented in an understandable manner. Readers of all disciplines are likely to encounter these issues. An effort has been made to provide the information in a way that is easy to comprehend to both experts and common citizens alike.

ABOUT THE AUTHOR

Dr. Sapna Nehra earned her M.Sc., Ph.D. From Banasthali Vidyapith and she has taught at various Universities. Currently, she is the officiating Dean Research, at Nirwan University Jaipur. She is guiding five Ph.D. scholars. Dr. Nehra has contributed twelve research papers with SCI and Scopus indexing and thirty-four book chapters. She has reviewed several manuscripts of ACS, Elsevier, and Springer. Dr. Nehra is also the editor of the CRC Press book and presented her work at numerous national and international conferences. She was awarded with Excellence award for promoting research and innovation at an international conference (2023) by NMIIET Bhubaneswar, Odisha. She has delivered many invited lectures and radio talks. She has served as an organizing secretary for many conferences, workshops, and FDPs.



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Emerging Trends in
Environmental Preservation

Sapna Nehra

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Emerging Trends in Environmental Preservation

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Dedicated to

Hon'ble Dr. S.L. Sihag

*Chairperson, Nirwan University Jaipur
for his kind inspiration and support*

Foreword



I am honoured to write this foreword for Dr Sapna Nehra's important new book, "Emerging Trends in Environmental Preservation." As humanity grapples with the critical challenges of climate change, pollution, and environmental degradation, Dr. Nehra's book provides a timely and insightful look at cutting-edge technologies and approaches for protecting our shared environment.

In this book, Dr. Nehra draws on her extensive expertise as an educator and researcher to provide readers with an accessible yet rigorous overview of key developments in environmental sensing, green materials, water remediation, and critical metal recovery. She explores innovative techniques such as sol-gel coatings, ionic liquids, and three-dimensional gas sensors that hold promise for addressing pressing environmental needs. Her examination of amorphous silicon solar cells and magnetic nanocomposite materials highlights exciting new directions in renewable energy and toxic metal removal.

Throughout the book, Dr. Nehra maintains a solutions-oriented perspective, elucidating the science

behind these technologies and their potential real-world applications. Her background as an experienced scientist and mentor shines through in her ability to synthesize complex technical concepts for a broad audience. The book's structure, moving from advanced sensing to emerging green technologies to critical areas like water treatment and metal recovery, provides a logical flow for readers interested in the full scope of environmental preservation.

With this accessible, informative guide, Dr. Sapna Nehra contributes to spreading awareness and understanding of progress in safeguarding the environment. Her book is essential reading for scientists, students, policymakers, and anyone concerned with building a sustainable future. Undoubtedly, it will inspire further innovation and help mobilize much-needed action on these urgent challenges. Introducing Dr. Nehra's work is a privilege, and I congratulate her on this impressive new publication.

Dhruva Kumar

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Preface



Environmental preservation become a serious concern for humanity in recent decades. A Various kind of anthropogenic activities occur in daily routine which affect the environment life in direct as well as indirect manner. A large number of micropollutants, heavy metals, toxic gases, pesticides, dyes, and other hazardous constituents largely accumulated in the environment. So, the exclusion of toxic pollutants worldwide is of utmost necessity. In this direction, many researchers developed smart materials for water remediation and environmental protection. In this book, chapter 1 covered the utilization of three dimensional towards the sensing of harmful gases like NO_2 , CO_2 , formaldehyde, etc. Chapter 2 has focused on how the green sol-gel technique is employed for corrosion prevention. Chapter 3 provides insight into ionic liquid-based techniques in the exclusion of toxic effluents from wastewater. Chapter 4 and Chapter 5 have discussed the role of amorphous silicon cells and magnetic nanoparticles mixed with nanocomposite could emphasize the recovery as well as removal of critical metals.

In this book, the focus is well well-being of the planet in the larger interest of environmental conservation. If the future of the coming generation has to be secured then the environment has to be saved from pollutants and conserved on a sustainable basis.

Dr. Sapna Nehra

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