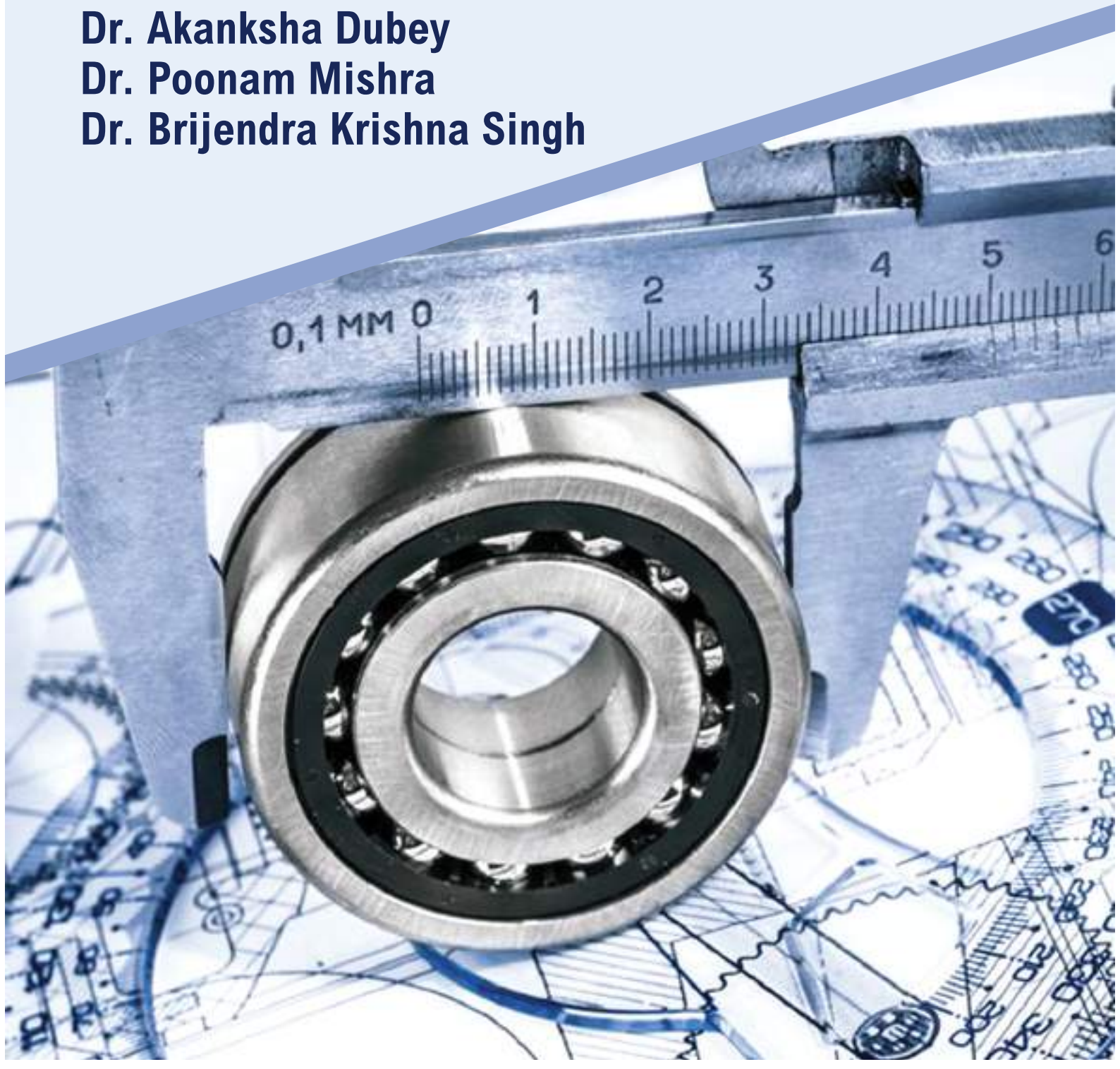


ISBN : 978-81-984369-2-4

FROM EQUATIONS TO INNOVATION
**THE POWER OF
MATHEMATICS
IN ENGINEERING**

Dr. Akanksha Dubey
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From Equations to Innovation: The Power of Mathematics in Engineering

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Aditi Publication

Publisher :

Aditi Publication, Raipur, Chhattisgarh, INDIA

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Year : **2025**

Edition - **01**

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Price : **Rs. 450/-**

Publisher & Printed by :

Aditi Publication,

Opp. New Panchajanya vidya Mandir, Near Tiranga Chowk,

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Beyond mathematics, Dr. Dubey is a certified Reiki Master Healer and Crystal Healer, integrating holistic healing into her professional and personal life. Her unique blend of analytical expertise and spiritual insight fosters a balanced approach to knowledge and well-being.

With a passion for education, research, and healing, Dr. Dubey inspires students and professionals, making significant contributions to mathematics and holistic wellness.



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Her research interests include Variational Inequalities, Fixed Point Theory, Analysis, and Optimization. She has also filed and granted IPR including copyright, and patents in allied areas of Mathematics, further establishing her contribution to the field.



Dr. Brijendra Krishna Singh is a distinguished Professor of Mathematics and Data Science at Chandigarh University, Lucknow, with over 15 years of experience in teaching, research, and academic leadership. He holds a Ph.D. in Mathematics specializing in Differential Geometry and has published extensively in SCI and Scopus-indexed journals, making significant contributions to the fields of Mathematics and Data Science.

Dr. Singh has taught various undergraduate and postgraduate courses, including Complex Analysis, Linear Algebra, and Operations Research. Beyond teaching, he has actively contributed to faculty development through FDPs and participation in national and international conferences.

In leadership roles such as Dean, Director of Student Affairs, and Director of Admissions, he has played a pivotal role in institutional development and academic policy formulation. Passionate about interdisciplinary research and technology-driven education, Dr. Singh continues to inspire students and faculty in their academic pursuits.

Preface

Mathematics has long been recognized as the driving force behind engineering innovations, providing the fundamental tools necessary for problem-solving, design, and optimization. *From Equations to Innovation: The Power of Mathematics in Engineering* explores how mathematical principles shape technological advancements and engineering breakthroughs across diverse disciplines.

This book is structured to provide a comprehensive and accessible approach to engineering mathematics, covering essential topics such as algebra, calculus, differential equations, and linear algebra. Additionally, it delves into advanced areas, including numerical methods, optimization techniques, complex variables, and discrete mathematics, equipping readers with the knowledge required to tackle complex engineering challenges.

With a strong emphasis on real-world applications, this work integrates theoretical foundations with hands-on computational tools, enabling engineers to model physical systems, optimize industrial processes, analyse large datasets, and innovate in fields such as robotics, signal

processing, and control systems. By presenting structured methodologies, case studies, and practical examples, the book offers a balanced perspective between mathematical rigour and applied engineering.

Designed for students, researchers, and professionals, this book aims to bridge the gap between mathematical theory and engineering practice. We hope that readers will find inspiration and confidence in using mathematical techniques to drive innovation, enhance efficiency, and contribute to the ever-evolving world of engineering.

*“Mathematics in Engineering is Like
the Soul to A Body—Giving it Structure,
Function, and Purpose, Transforming
Ideas Into Reality with Precision and
Logic”*

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Aditi Publication

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ISBN : 978-81-984369-2-4



9 788198 436924

₹ 450