

4th International Conference on
“Recent Trends in Engineering and
Technology”

ICRTET-2025

Organized By:

Hirasugar Institute of Technology, Nidasoshi.

Accredited at 'A⁺' Grade by NAAC, Programmes Accredited by NBA: CSE & ECE.

7th & 8th March 2025

In Association with

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4th International Conference on
“Recent Trends in Engineering and
Technology”

ICRTET-2025

Venue: NBA Seminar Hall, D-Block
Hirasugar Institute of Technology, Nidasoshi.

Editors

Dr. K. M. Akkoli

Dr. S. N. Topannavar

Dr. S. C. Kamate

Publish By:

A.R. Research Publication

Preface

Conference word and AR Research Publication is a fast-growing group of academicians in Engineering, Sciences, and Management. A R Research Publication is also known for its fast reply and zero-error work. The conference world has organized various conferences at renowned places namely Delhi University; New Delhi, Jawaharlal Nehru University; New Delhi, PHD Chamber of Commerce and industry New Delhi, YMCA New Delhi, India International Centre New Delhi, Sri Venknteswara College of Engineering and Technology, Andhra Pradesh, Vedant Engineering Kota and many more places across the country.

We are very pleased to introduce the proceedings of the 4th International Conference on Recent Trends in Engineering and Technology. The papers presented at the conference addressed the Recent Innovations & Development in field of Engineering and Technology. The level of Interest in the subject matter of the conference was maintained from previous events and over 113 suitable papers were submitted for presentation at the conference.

Papers were well represented at the conference to arouse a high level of international interest. The presented papers maintained the high promise suggested by the written abstracts and the program was chaired in a professional and efficient way by the session chairmen. The program was chaired professionally and efficiently by the session chairmen also highly gratifying, showing the high level of interest in the subject. This Proceeding provides a permanent record of what was presented. They indicate the state of development at the time of writing of all aspects of this important topic and will be invaluable to all authors in the field for that reason. Finally, it is appropriate that we record our thanks to our fellow members of the Technical Organizing Committee for encouraging participation from those areas. We are also indebted to those who served as chairmen, without their support, the conference could not have been the success that it was. We also acknowledge the authors themselves, without whose expert input there would have been no conference. Their efforts made a great contribution to its success.

About the Conference

ICRTET-2025 intends to provide a common platform to the Researchers, Academicians, Practitioners, Engineers, Research Scholars, PG, and UG Students in frontline evolutionary and challenging fields. It is expected to share their Knowledge and Research expertise to advance in Emerging Scientific Applications in Engineering and Technology and create a prospective collaboration and networking on various allied ventures.

About IARDO

International Association of Research and Developed Organization (IARDO) is a leading organization in the field of academic research activities under the banner of India Educational Charitable Trust (Regd).

International Association of Research and Developed Organization (IARDO) is an apex body that promotes and encourages commendable achievements from all over the country. The organization under conference world regularly organizes national and international level conferences with the help of its members to promote socially responsible education practices and sustainable development in economic as well social front in India.

About the College

SJPN Trust Nidasoshi was founded by His Holiness Shri Pancham Nijalingeshwar Mahaswamiji, the Ninth pontiff of Shri Siddha Sansthan Math Nidasoshi in 1984. Hirasugar Institute of Technology Nidasoshi was established in the year 1996. The institution is run by his holiness Shri Jagadguru Pancham Shri Shivalingeshwar Mahaswamiji the Tenth Pontiff under SJPN Trust. The institute is spread over on 48 acres of lush green campus. HSIT, Nidasoshi is approved by All India Council for Technical Education (AICTE), New Delhi, recognized by Govt. of Karnataka, and is permanently affiliated to Visvesvaraya Technological University (VTU), Belagavi. Hirasugar Institute of Technology (HSIT) is one of the premier engineering colleges located in the Belagavi district of North Karnataka. The institute is accredited by NAAC with an 'A+' grade and its UG programs by the NBA. The HSIT, Nidasoshi offers 4 years of full-time Bachelor of Engineering (B.E.) degree courses in four disciplines with a total intake of 360 students, 1. Mechanical Engineering, 2. Electrical & Electronics Engineering, 3. Electronics & Communication Engineering, 4. Computer Science &

Engineering. The campus has all the basic amenities for the overall development of the students with spacious infrastructure. The institute has well-equipped modern laboratories and a well-stacked computerized digital & open-access library system. The Institute has facilities like separate hostels for boys and girls, staff quarters, a Canteen, a Bank, a Guest house, a Generator, a Playground, a Multi-station gymnasium hall for indoor games, Yoga, and transportation for students and staff.

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Dean (Research & Development)

Dr. S. N. Topannavar,

Dean (Academics) & HOD, Mechanical Engineering.

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Former Vice-Chancellor, Sanjay Ghodawath University,

Kolhapur, Maharashtra India

Dr. Rasheedul Haque,

Professor, Mahsa University, Malaysia

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Message

Dr. Venkatesh Raikar,
Former Vice-Chancellor,
Sanjay Ghodawath University,
Kolhapur, Maharashtra India

It is a matter of great pride and privilege to be associated with the *4th International Conference on Recent Trends in Engineering & Technology (ICRTET-2025)*, organized by *Hirasugar Institute of Technology, Nidasoshi*, on *March 7th-8th, 2025*.

Hirasugar Institute of Technology has consistently provided a platform for innovative ideas, fostering meaningful discussions through seminars and conferences. This event serves as a crucial bridge between academicians, policymakers, and corporate leaders-connecting regional expertise with national and international communities.

I extend my best wishes to all participants, esteemed delegates, and distinguished speakers. ICRTET-2025 is poised to be a remarkable forum for exchanging contemporary research insights, and I aspire to see it evolve into an annual tradition. Beyond discussions, the conference aims to cultivate a strong culture of academic exchange, which is essential for achieving excellence in research.

My heartfelt congratulations to the Institute for organizing this prestigious event. Wishing *ICRTET-2025* grand success and a future filled with impactful collaborations!

Dr. Venkatesh Raikar,
Former Vice-Chancellor,
Sanjay Ghodawath University,
Kolhapur, Maharashtra India



Message

Shri Vijay Mangeshakar

Director, Deloitte, Pune

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My heartfelt congratulations to the Institute for organizing this prestigious event. Wishing *ICRTET-2025* grand success and a future filled with impactful collaborations!

Shri Vijay Mangeshakar

Director, Deloitte, Pune



Message

Dr.S.C. Kamate,
Principal,
Hirasugar Institute of Technology,
Nidasoshi

It is with great delight that Hirasugar Institute of Technology, Nidasoshi is organizing the 4th International Conference on Recent Trends in Engineering & Technology (ICRTET-2025) on March 7th-8th, 2025.

In today's rapidly evolving world, continuous research, adaptation, and innovation drive technological advancement and societal growth. This dynamic landscape demands thoughtful design, meticulous planning, and diligent oversight to ensure meaningful progress. Research in Education, Engineering, Science, Commerce, and Management has significantly contributed to the development of a highly advanced and sophisticated society. This conference aims to serve as a premier platform for leading academicians, researchers, practitioners, and students to engage in insightful discussions, exchange knowledge, and share valuable experiences. I am confident that ICRTET-2025 will foster the exchange of innovative ideas and best practices, ultimately benefiting society at large. I extend my heartfelt gratitude to our Management, coordinators, esteemed colleagues, and dedicated students for their relentless hard work, dedication, and commitment in making this Mega Event a resounding success.

Wishing ICRTET-2025 a grand success and looking forward to an enriching and impactful event!

Dr. S. C. Kamate,
Principal & Chief Convener



Message

Dr. K. M. Akkoli,
Dean Research and Development

It is with great enthusiasm that I share the announcement of the 4th International Conference on Recent Trends in Engineering & Technology (ICRTET-2025), scheduled for March 7th-8th, 2025. In today's interconnected world, research and innovation are pivotal in addressing global challenges. Administrators, corporate leaders, and policymakers are continuously adopting advanced strategies to navigate a dynamic and competitive landscape. This conference aims to serve as a collaborative platform for dedicated academicians, research scholars, and students from across India and beyond to engage in insightful discussions on critical research issues.

Active participation in exploring contemporary topics in Education, Engineering, Science, and Management will help bridge the gap between research and practical applications, fostering growth and societal development. I sincerely seek your support and best wishes for the success of this international conference. My heartfelt gratitude goes to our Management, Principal, faculty, staff, and students for their invaluable contributions, both direct and indirect, in making this event possible.

Dr. K. M. Akkoli
Dean Research and Development
Convener



Message

Dr. S. N. Topannavar,
Dean Academics and HOD
Mechanical Engg. Department

It is with great enthusiasm that I announce the 4th International Conference on Recent Trends in Engineering & Technology (ICRTET-2025), scheduled to be held on March 7th-8th, 2025. In today's interconnected world, research and innovation play a crucial role in shaping industries and policies. Administrators, corporate leaders, and policymakers are continually adopting advanced strategies to navigate an increasingly competitive landscape. This conference aims to serve as a vibrant platform for academicians, research scholars, and students from across India and beyond to engage in meaningful discussions on contemporary research challenges.

Our collective efforts in exploring the latest advancements in Education, Engineering, Science, and Management will contribute to practical applications and societal development. I encourage active participation and collaboration to drive impactful solutions for a better future.

I sincerely appreciate the unwavering support of our Management, Principal, faculty, staff, and students-all of whom have played an integral role in making this conference a reality. With your continued encouragement and involvement, ICRTET-2025 is poised to be a grand success.

Dr. S. N. Topannavar
Dean Academics and HOD
Mechanical Engg. Department,
Convener



Message

Ms. Reshu Gupta,
CEO Conference World

It gives me immense pleasure to note that the *4th International Conference on Recent Trends in Engineering & Technology (ICRTET-2025)* is set to take place from *7th – 8th March 2025*. This prestigious event promises to bring together a dynamic exchange of ideas, fostering meaningful discussions on emerging trends and innovations in engineering and technology.

I am confident that this international conference will serve as an excellent platform for intellectual deliberation, collaboration, and knowledge-sharing in a rapidly evolving landscape. I extend my best wishes to all participants, esteemed delegates, and distinguished speakers.

Moving forward, I aspire to establish this event as an annual tradition, ensuring a sustained culture of academic exchange and excellence. Such interactions are pivotal in driving progress and shaping the future of this field.

My heartfelt congratulations to the organizing institution for hosting this significant event. Wishing ICRTET-2025 great success!

Ms. Reshu Gupta,
CEO Conference World

Proceeding of the conference has been published with **ISBN: 978-93-48954-14-5**

4th International Conference on Recent Trends in Engineering & Technology (ICRTET-2025) organized at NBA Seminar Hall, D-Block, Hirasugar Institute of Technology, Nidsoshi. Total 113 papers were received for the conference and 71 papers were shortlisted by the committee.

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