

XANTHRA RMAN



**DEPARTMENT
OF
MECHANICAL
ENGINEERING
2021-22**

ABOUT THE INSTITUTE

NIT Silchar was established as a (REC) Regional Engineering College in 1967. In the year 2002, it was transformed into an NIT and bestowed with the status of deemed University. Subsequently, in the year 2007, it was upgraded to an "Institute of National importance". NIT Silchar is accredited Nationwide as one of the kingpins in the fields of Engineering and Research and has been ranked as one of the best Institutes in India by leading surveys. The programs and courses offered at NIT Silchar inveterately evolve to adapt to the ever-changing Global requirements in the fields of Technology, Innovation and Research. Being one of the best Engineering colleges in East India, the college includes State-of-the-Art Labs, Centre for Development of Advanced Computing (CDAC) and a fully functional research Promotion Cell. All of this, combined with one of the World's largest digital libraries, has positioned the Institute as the Region's Technical Education hub. This headway and progression over the years speak volumes about the Institute's educational quality. This is largely reflected in the Companies' trust in the students, as seen by their continued visits to the Institute for recruitment. NIT Silchar's Alumni have always maintained the School's flag flying high by working in some of the World's most opulent and prestigious Industries and occupying top leadership positions in Fortune 500 Corporations. The palatial, thriving and resplendent campus, which covers 600 acres and boasts a state-of-the-art support system and prolific and swish infrastructure, contributes to its reputation for generating erudite and perspicacious minds. NIT Silchar is one of the oldest T-schools in the country with the Industry Institute linkage getting cemented over the years. The courses are regularly restructured to meet the ever-changing industry requirement. Our students are unremittingly been able to display excellent prowess and skills in their fields of Academic and extracurricular activities since its inception. NIT Silchar has the vision to provide quality technical education and to act as a centre of excellence and transcendence for Engineering and Scientific Research. Today NIT Silchar is considered a national brand and in clinching this position, a major contribution has come from the Faculty and Staff as well as our students and the Alumni. The study programs here are at NIT Silchar are designed to ingrain Leadership, Teamwork and Global Focus among learners. We profoundly invite Organizations and Corporations to come and test the skills of The Young pool of talents and burgeon long-lasting nexus with our Institute.



ABOUT THE DEPARTMENT OF MECHANICAL ENGINEERING

Mechanical engineering is one of the most diverse and versatile engineering fields. This is a branch of engineering that combines engineering physics principles and mathematics with materials science, to design, analyze, manufacture, and maintain mechanical systems.

The Mechanical Engineering Department is one of the oldest and finest Departments in the region. The workshops of the Department contain highly sophisticated machines presenting a unique and unparalleled quality. The Department has contributed with various active participation in research & publication for National Journal & Conference as well as International Journal & Conference.

The Mechanical Engineering Society (MES) is an integral part of the Department which aims at bringing the best out of the students and helping them refine their skills through various activities conducted by the Society with the sole intention of fostering technical, tactical, design & leadership skills. The Society is also involved in active consultancy works for the development and utilization of resources of North-Eastern India.

The development activities are undertaken by the Department to put the students on busy schedules enabling them to meet local, national, and global economic and social needs of human society in a self-sustained manner which would help them to blend into the modern industry requirements.



DIRECTOR'S NOTE

Professor Sivaji Bandyopadhyay
Director, NIT Silchar

It gives me an immense pleasure to learn that the Department of Mechanical Engineering is publishing its first Technical Magazine. Technology today has taken a completely new form that was not imaginable years back. National Institute of Technology Silchar has emerged as a Centre of Par Excellence Learning in the area of technical education and ranks as one of the top technical institutions of India. This magazine will be a great platform for students to showcase their talents and bring out their knowledge and imagination. I appreciate the endeavor and hope this will continue in future as well and everyone will contribute one's best effort to keep the momentum on.

Jai Hind!

Professor Sivaji Bandyopadhyay
Director,
National Institute of Technology Silchar



COORDINATOR'S NOTE

Dr. Sumit Bhowmik
Department of Mechanical Engineering,
NIT Silchar

I am pleased to know that the Department of Mechanical Engineering is successful in bringing the first issue of the Technical Magazine. Yantarnav, the departmental magazine has the prime objective of providing aspiring engineers a wide platform to showcase their technical knowledge and to pen down innovative ideas. This magazine is intended to bring out the hidden literary talents in the students and teachers to inculcate strong technical skills among them.

I congratulate and thank all the students and faculty coordinator who have made untiring efforts to bring out this magazine. I wish them all the very best for releasing more such magazines in future.

Dr Sumit Bhowmik
Coordinator, Yantarnav

DEPARTMENTAL ACHIEVEMENTS

- Department received 28 no. of sponsored projects from different Govt. funding agencies worth Rs. 8.70 Crore (approx.).
- Continuous improvement in the research publications (186 no. in 2020-21) in reputed journals.
- Books published by the faculty members: 05 nos.
- 05 no. of Patents granted and 15 no. of Patents Published.
- Established 02 no. of Centers – one as “Solar Regional Test Centre” funded by MNRE and the other as “Advanced Manufacturing and Material Testing” funded by DST-FIST.
- Successfully organized 03 editions of International Conference on Recent Advancements in Mechanical Engineering (ICRAME) in 2020, 2021 and 2022, respectively and 4th edition is scheduled on February 2023.
- Prof. Rajat Gupta served as Director of NIT Srinagar and NIT Mizoram.
- Dr. Sudipta Halder and Dr. Biplab Das have earned Post Doctoral fellowships in abroad.
- Prof. K.M. Pandey, Prof. R.D. Misra, Dr. Sudip Dey, Dr. Vinyas Mahesh is recognized as top 2% scientist list in 2021 by Elsevier & Stanford University.
- Started 5th PG programme in Renewable Energy, an interdisciplinary in nature, in 2021.
- 23rd February, 2022. 9 number of newly established laboratories have been inaugurated.
- Team "Four Squared" (UG) ranked 9th globally in SDC student competition under ASME E-Fests 2022.
- Team "GodSpeed" (UG) ranked 8th globally in IAM3D student competition under ASME E-Fests 2022.
- Team "Wissen Mechansis" (UG) secured 3rd place on a global ranking in ASME Environmental Systems Division Competition under ASME E-Fests 2022.

PREFACE

Technical papers play a pivotal role in moulding the young and budding research culture in India. It puts to challenge in pushing intellectual limits to the farthest in return of collective scientific and technical advancement. This departmental magazine technical magazine presents a compilation of selected comprehensive technical papers by the students of National Institute of Technology, Silchar. It gives us a sneak peek at the vast multitude of areas of interests of students in field of mechanical engineering along with a comprehensive account of what they think are the little-known and recent advancements in the field which appeals to their minds the most. It shows what the students at NIT Silchar are capable to produce and collect extensively when their intellectual capabilities are challenged in absence of curricular restrictions. Lot of scientific advancements in the world go unnoticed due to various reasons. To counter this, the magazine strives to spread awareness among coming younger generations of aspiring engineers on the various advancements in various technical fields and scope of improvement in them which allows them to be more equipped than ever before to improve on what is already built to a better and more prosperous society.

ACKNOWLEDGEMENT

It gives us immense pleasure that the creation of this magazine has indeed been a successful journey. For this, we would like to express my sincere gratitude to the honourable Director of NIT Silchar, Prof. Sivaji Bandyopadhyay, for his constant support and motivation towards the publication of the Departmental Magazine.

Our sincere thanks to all the faculty members for their constant guidance and endless support. We would like to thank all the student members responsible for the publication of the Magazine for effectively coordinating and organizing everything to pull this through. We would also like to mention to Dr. Sukumar Pati, Assistant Professor, Department of Mechanical Engineering for his valuable advice and endless effort in reviewing the Magazine.

We express our considerable appreciation to all the authors of the articles in this magazine. These contributions have required a generous amount of time and effort. Nurturing creativity and inspiring innovation are two of the key elements of a successful education, and this magazine is the perfect amalgamation of both. It harnesses the creative energies of the academic community, and distils the essence of their inspired imagination in the most brilliant way possible. It is this willingness to share knowledge, concerns and special insights with fellow beings that have made this magazine possible.

At the end, we would like to thank Prof. Rahul Dev Misra, Department of Mechanical Engineering for constant motivation and sparing his valuable time to contribute the theme write-up for the first edition of Yantranav.

-MAGAZINE TEAM

INDEX

Sl. no.	Article	Author(s)	Page no.
1	HEALTHCARE ENGINEERING: AN EMERGING PROFESSION	DR. R.D. MISRA	9-11
2	HYDRAULIC LIFTS FOR CAR PARKING	SHREYAS KUMAR	12-14
3	CREAM OF THE CROP: THREE BLADES OR TWO BLADES?	SRIRAMANA SUDAMALLA, SUKUMAR PRATHIPATI	15-16
4	INTERNATIONAL THERMONUCLEAR EXPERIMENTAL REACTOR (ITER)	HANNAN AFRIDI, ASHISH HANDIQUE	17-19
5	CHANDRAYAAN 2: MECHANICAL INNOVATIONS THAT COULD HAVE SAVED VIKRAM LANDER	FIROZ KHAN	20-22
6	NEW ADVANCES IN AUTOMOTIVE TRANSMISSION	BIKIRAN KALITA UPPALA SUDHIR	23-25
7	ION THRUSTERS	RIDHA RANI PRADHAN, SMRUTI SOURAV	26-27
8	MECHATRONICS	SUNKARA LAVANYA	28-30
9	USING ULTRASOUND AS A MEANS OF DAMAGING CORONA VIRUS	DHRITIRAJ KALITA Aishik Dinda	31-32
10	THE LARGE HADRON COLLIDER	HRIDOY RANJAN KALITA, SMRUTI SOURAV	33-34
11	AUTOMOTIVE ELECTRIC RICKSHAW: A STEP TOWARDS SUSTAINABLE DEVELOPMENT	NOOR AMEEN AHMED, ABU BAKAR SIDDIQUE CHOUDHURY	35-37
12	SOFT ROBOT, THE FUTURE OF ROBOTICS	SHAINANDNI, HRIDOY RANJAN KALITA	38-39
13	THE LARGE DEAD DOWNWIND FASTER THAN THE WIND VEHICLE	SMRUTI SOURAV, RIDHA RANI PRADHAN	40-42
14	HAND GESTURE CONTROL ROBOT	THV SANDHYA RANI, DOMMETI SAI PRUDHVI	43-44