ISSUE: 2 | VOLUME: 4 | YEAR: 2023-24

St. XAVIER'S CATHOLIC COLLEGE OF ENGINEERING (Autonomous)

Chunkankadai, Nagercoil - 629003
Kanyakumari District, Tamil Nadu

Approved by AICTE & Affiliated to Anna University, Chennai
Accredited with 'A' Grade by NAAC
UG Programs(ECE, EEE, Mech, Civil, CSE & IT) Accredited by NBA
Anna University Recognized Research Institute
Recognized under section 2(f) & 12(B) of UGC Act, 1956
UG Programs(ECE, EEE, Mech, Civil, CSE & IT),
MBA & MCA Programs Permanently Affiliated

News Letter

Department of Mechanical Engineering

"The object of education is to prepare the young to educate themselves throughout their lives."

Department Vision

Developing technically sound mechanical engineering professionals to serve the global community with academic excellence and innovative research

Department Mission

M 1 To transform the students into mechanical technocrats with clear conceptual understanding and hands-on experience

M 2 To integrate the fundamentals with recent concepts through technical gatherings, research and industry interactions

M 3 To impart managerial quality and develop soft skills through leadership and personality development programs

M 4 To inculcate core human values through ethical practices and inspire them to serve the society

HoD's Message

It gives me immense pleasure to present the Department of Mechanical Engineering newsletter for the period of January to May 2024. This edition showcases a vibrant tapestry of academic excellence, innovative research, impactful workshops, and spirited student participation.

Our faculty members continue to set high standards in research and development, with numerous publications in reputed journals, participation in faculty development programs, and contributions as resource persons in various technical domains. I am particularly proud of the significant strides our department has made in patent filings and interdisciplinary research activities that align with emerging industrial trends.

The Mechanical Engineering association (MEGX) has been instrumental in organizing a plethora of value-added programs from seminars and industrial visits to national-level symposiums cultivating both technical acumen and leadership qualities in our students.

Our students have brought laurels to the department by excelling in various intercollegiate events, further affirming our commitment to holistic development and academic rigor.

I extend my heartfelt gratitude to all faculty members, supporting staff, and students whose passion and perseverance have driven these accomplishments.

Dr. G. Antony Miraculas

ABOUT THE DEPARTMENT

Established in 2003, the Department of Mechanical Engineering offers both undergraduate and postgraduate programs with a strong focus on research, innovation, and industry collaboration. The department fosters professional growth through active student associations such as MEGX, SAE, and ISHRAE, which regularly organize workshops, seminars, and industry-engagement activities. Accredited by the NBA and granted autonomous status, the department remains committed to academic excellence by continuously updating its curriculum in line with industry needs, equipping students with hands-on skills and exposure to cutting-edge technologies.

Editors

Dr. G. Antony Miraculas
Dr. Y. Balto
Mr. Vishaal V (IV Mech.)
Mr. Felix P (IV Mech.)

Student Project Selected for Niral Thiruvizha

We are proud to announce that two of our student project batch has been selected to be showcased at Niral Thiruvizha, a prestigious innovation and cultural festival that celebrates creativity and impact. This is a wonderful achievement that highlights the talent, hard work, and innovation of our students.

Compostable Bio Films from Shrimp Waste

This eco-conscious research explores the transformation of shrimp shell waste, a common byproduct of seafood industries into sustainable, biodegradable films. By utilizing Polyvinyl Alcohol (PVA) as a base and integrating powdered shrimp waste through solution casting, the students aimed to develop biofilms with applications in food packaging. The process not only contributes to environmental conservation by repurposing marine waste but also taps into the natural antibacterial and antifungal properties of shrimp shell components, particularly chitin.

Students: Jenitto J., Jerprin J., Joel J., Praisewin E. S.
Supervisor: Dr. G. Antony Miraculas, Assoc. Professor

The project underwent a comprehensive series of characterizations, including SEM, EDX, TGA, DSC, and mechanical testing, to evaluate the structural, elemental, thermal, and physical properties of the fabricated films. The results confirmed good film-forming ability, mechanical flexibility, and promising thermal stability, marking the potential of these biofilms as a viable alternative to conventional plastic-based packaging. This project stands as a commendable example of sustainable engineering and practical waste-to-wealth innovation, aligning perfectly with the ethos of Niral Thiruvizha in promoting community-relevant, eco-friendly technological solutions.

Mitigation of CO_2 emissions from cement industry through microalgae cultivation in a photobioreactor

Anthropogenic climate change, global warming, environmental pollution, and fossil fuel depletion are urgent challenges confronting humanity, with industrial sectors like cement plants playing a major role. Cement production alone accounts for about 15% of global pollutant emissions, posing significant risks to human, plant, and animal health. Despite these environmental impacts, cement-based materials remain essential, driven by rapid urbanization and growing demands in civil engineering, medicine, and related fields. Various filtration, recycling, and modeling techniques have been explored to mitigate these effects, yet a definitive, efficient solution remains elusive.

A promising strategy involves the use of microalgae, a versatile resource for products such as biofuels, food supplements, cosmetics, and pharmaceuticals. However, contamination issues limit the efficiency of traditional open raceway ponds for biomass cultivation. To address this, a novel photobioreactor was designed and fabricated for atmospheric microalgae growth, offering a controlled alternative. Installing 20 to 30 such reactors within cement plant campuses could harness large amounts of atmospheric CO_2 and wastewater, with an estimated 80% of CO_2 emissions being captured and utilized for microalgae cultivation. This approach presents a sustainable and innovative solution for carbon mitigation while generating valuable biomass.

Students: Malvin Reno A, Nithesh A, Riwan Mejo, Shajan R
Supervisor: Dr. Ajith J Kings. Assoc. Professor

Crazy Coconut MOU signing

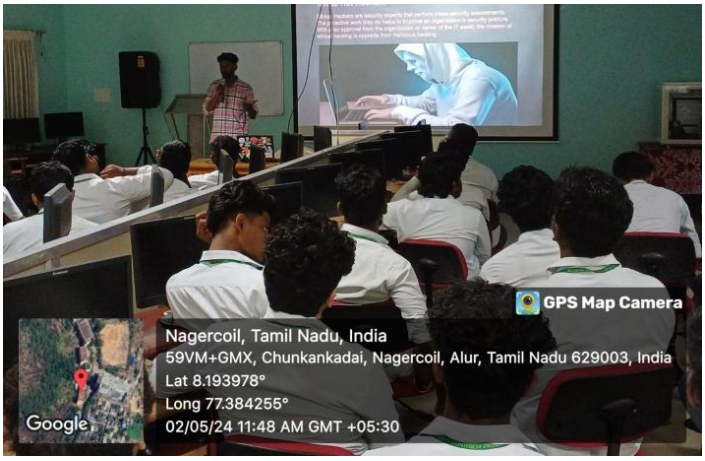
On 07-02-2024, a significant milestone was achieved with the signing of a Memorandum of Understanding (MoU) under the initiative titled “Crazy Coconut.” This collaboration marks the beginning of a strategic partnership aimed at fostering knowledge exchange, skill development, and industry-academia engagement in the coconut-based sector. The MoU sets the foundation for future seminars, workshops, internships, and joint research opportunities, creating a platform for students to gain practical insights and industry exposure. This initiative reflects our commitment to empowering students with real-world learning experiences.

Association Activity

Awareness Program on Ethical Hacking

MEGX, the professional association of the Department of Mechanical Engineering, organized an informative and thought-provoking awareness program titled “To Create Awareness: Ethical Hacking” on 02/05/2024. The session was specifically designed for final-year engineering students, aiming to introduce them to the fundamentals of ethical hacking and its growing relevance in today's digital landscape.

The program was facilitated by Mr. K.A. Edwin Antony, a skilled trainer from G-TEC Solution, Nagercoil, who provided valuable insights into the importance of cybersecurity, ethical responsibilities of hackers, and career opportunities in the field. The session helped students understand how ethical hacking can be used as a powerful tool to protect systems, data, and networks from malicious attacks.



Through interactive discussions and real-world examples, the awareness program succeeded in igniting curiosity and encouraging students to explore interdisciplinary domains that bridge mechanical engineering and information technology.

National Level Technical Symposium

The Mechanical Engineering Guilders of Xaviers successfully organized a National Level Technical Symposium on 24/04/2024. The event was aimed at nurturing leadership qualities, technical acumen, and professional development among third-year mechanical engineering students.

The highlight of the symposium was an inspiring session led by Mr. Shambu S. Krisha, Scientist at DRDO, BrahMos Aerospace, who shared his extensive knowledge and experience in cutting-edge defense technologies and project leadership. His address emphasized the significance of innovation, teamwork, and ethical responsibility in engineering careers, particularly within high-stakes environments like defense research and development.

The symposium provided a dynamic platform for students to engage in technical discussions, enhance their communication and leadership skills, and gain valuable exposure to real-world engineering challenges. It was a highly motivating experience that encouraged students to think beyond the classroom and prepare themselves as future leaders in the engineering field.

Enrichment Program on CAD/CAM/CAE

The Mechanical Engineering Guilders of Xaviers’ (MEGX) organized an Enrichment Program on 26/02/2024 to enhance students' knowledge in CAD/CAM/CAE. The session was conducted by Er. M.V. Magesh, Technical Head, CAD POINT, Marthandam. He provided valuable insights into the practical applications of design and manufacturing software in the mechanical industry. The program helped students understand industry standards and sharpen their technical skills. It was an engaging and informative session that bridged academic learning with real-world applications.

Safety First: Awareness Program on Fire and Safety

The Mechanical Engineering Guilders of Xaviers', organized an Awareness Program on Fire and Safety on 22/02/2024 for third-year mechanical engineering students. The session was conducted by Miss Sheeba from IRSC Fire and Safety Institution, who emphasized the importance of fire safety measures, emergency preparedness, and workplace safety protocols. The program aimed to educate students on essential safety practices and equip them with the knowledge to respond effectively in critical situations. It was an informative and impactful session that highlighted the significance of safety in engineering environments.

Career Opportunities in Piping Design

The MEGX, organized an insightful session on "Career Options in Piping Design" on 21/02/2024 for third-year mechanical engineering students. The program was conducted by Mr. N. Suresh, an expert from Educad Tech, Nagercoil, who shared his industry knowledge and experience in the field of piping design and engineering.

The session aimed to motivate students by introducing them to the vast career opportunities available in piping design, a critical domain in industries such as oil & gas, petrochemicals, power plants, and infrastructure. Mr. Suresh highlighted the importance of mastering piping design software, industry standards, and project workflows to build a successful career in this niche yet in-demand field. The program inspired students to explore specialized skills and prepare for industry-ready roles in mechanical engineering.

Career Options for Mechanical Engineers

MEGX, organized an orientation program titled "Career Options for Mechanical Engineers" on 24/01/2024. The session was conducted by Mr. E. Vasanth Raj from ECC Academy, Nagercoil, and was aimed at guiding mechanical engineering students in exploring diverse career paths and opportunities within their field. The resource person provided valuable insights into industry demands, higher education options, and essential skills required for professional success. The program served as a motivation for students to actively plan and pursue their career goals with clarity and confidence.

Book Chapter Publication – Contribution to Sustainable Transportation Systems

Dr. G. Antony Miraculas, has made a significant academic contribution by authoring a book chapter in the publication titled "Multi-Energy Management Schemes for the Sustainability of Intelligent Interconnected Transportation Systems." This scholarly work is part of a collaborative academic initiative at St. Xavier's Catholic College of Engineering and has been published by Wiley in the year 2024.

The chapter delves into innovative energy management techniques that are crucial for achieving sustainability in modern transportation networks, especially in the context of intelligent and interconnected systems. The author contribution highlights cutting-edge research and practical solutions aimed at reducing energy consumption and improving the environmental footprint of transportation infrastructures. His work adds immense value to the academic and research community, underlining the institution's active role in advancing

sustainable technologies through impactful research and publications.

Faculty Development Programs (FDPs), Workshops & Conferences Attended

The faculty members of the Department of Mechanical Engineering actively participated in various Faculty Development Programs (FDPs), Workshops, and Conferences during the academic year 2023-2024 (even semester) to enhance their knowledge, teaching methodologies, and technical skills across diverse domains. A summary of their participation is given below:

St. Xavier's Catholic College of Engineering (SXCCE)

Mr. P. Jose Aloysius attended an online FDP on "Artificial Intelligence in Education" on 24.06.2024.

Mr. V. T. Vijumon & Dr. Ajith J. Kings attended the FDP on "Teaching, Learning and Research Methodology" from 19.02.2024 to 23.02.2024.

Dr. Gerald Arul Selvan participated in the Online fdp on "Artificial Intelligence in Education: Integrating AI into Computer Science Curriculum" from 24.06.2024 to 29.06.2024, and also attended the FDP on "Innovative Teaching Pedagogies" organized by the Internal Quality Assurance Cell (IQAC), SXCCE from 29.02.2024 to 03.03.2024.

Mr. Anwar Rajesh M.M attended multiple FDPs at SXCCE:

"Artificial Intelligence Integrated with Cloud Applications" (ECE Department) from 27.05.2024 to 31.05.2024

"Teaching, Learning and Research Methodology" (AI&DS Department) from 19.02.2024 to 23.02.2024

"Artificial Intelligence in Education: Integrating AI into CSE Curriculum" from 24.06.2024 to 29.06.2024

Dr. G. Shanthos Kumar participated in the FDP "Academic English Language Practices – English Language Lab" organized by the Training and Placement Cell, SXCCE from 21.02.2024 to 24.02.2024.

NITTTR (National Institute of Technical Teachers Training and Research)

Mr. V. T. Vijumon attended two FDPs conducted by NITTTR: "Developing Soft Skills" from 12.02.2024 to 16.02.2024 and "Communication at Workplace" from 22.07.2024 to 26.07.2024

Dr. G. Shanthos Kumar also attended "Developing Soft Skills" from 12.02.2024 to 16.02.2024.

Dr. D.X. Tittu George attended an FDP on "Big Data Analytics for Smart Grid" organized by NITTTR Chandigarh and hosted at SXCCE from 12.02.2024 to 16.02.2024.

University College of Engineering, Nagercoil

Dr. G. Antony Miraculas, Dr. Ajith J. Kings, Mr. J. Gnana Rajan, Mr. Jude Vinoth V. & Mr. Adritovin F. attended an FDP on "Additive Manufacturing" from 24.06.2024 to 29.06.2024, organized by the Centre for Faculty and Professional Development (CFPD), Anna University, Chennai.

Other Institutions and Events

Mr. V. T. Vijumon attended an International Conference on Mathematical Sciences at Alliance University from 28.04.2024 to 29.04.2024 & an FDP on "Fusion 360" conducted by BIMLABS, Trivandrum from 25.05.2023 to 27.05.2023.

Dr. M. Felix Xavier Muthu attended an FDP on "Hybrid Education for Pedagogical Success" organized by Saveetha College of Liberal Arts and Science from 09.01.2024 to 13.01.2024 and a Workshop on "Research and Innovation" organized by the Institution Innovation Council, St. Francis Xavier College on 20.01.2024.

Dr. Gerald Arul Selvan & Dr. J. Jebeen Moses completed an NPTEL FDP on "Principles of Casting and Welding" from 05.01.2024 to 26.03.2024, and attended an FDP on "AI Integrated with Cloud Applications" from 221.01.2024 to 15.03.2024.

Mr. Anwar Rajesh M.M attended an FDP on "Intellectual Property Rights and Patent" conducted by Dr. M.G.R. Educational and Research Institute from 20.05.2024 to 24.05.2024.

Dr. D.X. Tittu George also participated in an International Online Conference titled "UMAGINE TAMIL NADU" hosted by ICT Academy at Chennai Trade Centre from 23.02.2024 to 24.02.2024.

Mr. T. Michel Raj attended a Virtual FDP on "Intellectual Property Right and Patent Drafting" conducted by AMET University from 04.01.2024 to 08.01.2024 and an Online Seminar on "Product Development Process" conducted by SRM Madurai College for Engineering and Technology on 14.01.2024.

Dr. G. Shanthos Kumar also attended an online FDP on "Energizing Sustainability through Renewable Energy Systems" organized by SKIT, Jaipur from 18.03.2024 to 22.03.2024.

Mr. Jude Vinoth V attended an FDP on "Drone Technology" conducted by Garuda Aerospace Pvt. Ltd., Chennai from 07.01.2024 to 07.05.2024.

FDP organized on Electric Vehicle Technology and Manufacturing

Dr. G. Shanthos Kumar, faculty member of the Department of Mechanical Engineering, successfully organized a Faculty Development Program (FDP) on "Electric Vehicle Technology and Manufacturing" from 29th January 2024 to 3rd February 2024. This FDP was conducted under the Naan Mudhalvan initiative, aimed at empowering faculty members with cutting-edge knowledge in emerging technologies.

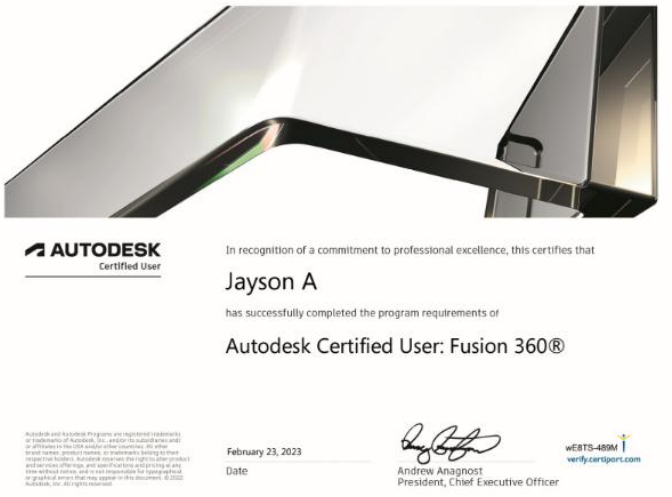
The program focused on the fundamentals and advancements in electric vehicle (EV) design, battery technologies, power electronics, and manufacturing processes. It provided a platform for knowledge sharing among experts and educators, thereby enhancing teaching capabilities in the field of sustainable automotive technologies. The event saw enthusiastic participation and was well-received for its relevance and practical approach to the rapidly growing EV sector.

AutoDesk Certificate Courses

Fusion 360 - Empowering Design Skills

The Department of Mechanical Engineering, in collaboration with AutoDesk through the ICT Academy, organized a Certificate Course on AutoDesk Fusion 360 from 8th January 2024 to 13th January 2024. This industry-relevant program aimed to equip students with practical knowledge and hands-on experience in 3D design, modeling, simulation, and product development using the powerful Fusion 360 software platform. The course was structured to bridge the gap between academic concepts and industry requirements in the domain of computer-aided design (CAD).

A total of 114 students successfully completed the course and were certified by AutoDesk, demonstrating their proficiency in Fusion 360 and their readiness to apply these skills in real-world engineering scenarios. The program was coordinated by Mr. P. Jose Aloysius, who ensured the smooth conduct of sessions and active student engagement. The initiative not only enhanced the technical skill set of the participants but also boosted their confidence and employability in the design and manufacturing industries.



AutoCAD – Enhancing Technical Drawing Skills

The Department of Mechanical Engineering, in association with AutoDesk through the ICT Academy, successfully organized an AutoCAD Certificate Course from 21st January 2024 to 31st January 2024. This course aimed to provide students with a strong foundation in computer-aided drafting (CAD) using AutoCAD, one of the most widely used software tools in engineering, architecture, and design. The program focused on developing essential skills in 2D drafting, isometric drawing, annotation techniques, and interpreting technical drawings — all vital for students aspiring to enter core design industries.

Under the dedicated coordination of Mr. V.T. Vijumon & Dr. J. Jebeen Moses, the course was conducted smoothly and saw active participation and enthusiasm from the students. A total of 106 students completed the training and were certified by AutoDesk, marking a significant step in their professional development. This certification adds great value to their academic profile, making them more competitive and industry-ready. The initiative reflects the department's continued efforts to offer industry-aligned training and equip students with tools that meet current technological demands.

Patent Published – Innovation in Agricultural Machinery

Dr. M. Gerald Arul Selvan, faculty member of the Department of Mechanical Engineering, has achieved a remarkable milestone with the publication of a patent titled "Chain Trencher for Agricultural Application." This innovative invention has been officially published by the

Department for Promotion of Industry and Internal Trade (DPIIT) and was sanctioned on 26th January 2024.

The patented Chain Trencher is designed to address challenges in modern agricultural practices by enhancing soil trenching efficiency for irrigation, planting, and soil management. This invention is a significant contribution to the field of agricultural machinery, combining engineering ingenuity with practical utility for farmers. Dr. Gerald Arul Selvan's achievement not only brings pride to the institution but also reflects the department's ongoing commitment to research, innovation, and community-oriented engineering solutions.

In-Plant Training Participation Summary

During the academic year 2023–2024, a total of 77 students underwent in-plant training at various organizations. Kerala Automobiles Limited hosted 8 students, TNSTC Ranithottam trained 27 students, and ISRO Mahendragiri welcomed 2 students. IREL Manavalakurichi provided training for 6 students, while Hyundai Motors India Limited, The Kerala Minerals and Metals Ltd., HI-Tech CNC Automation, Sree Ganapathy Motors, TVS Rubber Sundaram Pvt Ltd., Parfait Engineering, and Wind Energy Plantation Pvt. Limited each accommodated 1 student. TANGEDCO trained 6 students, Tuticorin Thermal Power Station hosted 5 students, Rane (Madras) Limited (Intern) accepted 2 students, and Delta Weartech Engineers Pvt. Ltd. trained 5 students. Additionally, Kaashiv Infotech provided training to 9 students. This broad distribution across prominent industries helped the students gain valuable practical exposure relevant to their academic curriculum.

Student Achievements and Honors

Several Mechanical Engineering students actively participated in various nonprofessional and state-level competitions and received prestigious awards. Under the Fine Arts Club, Abinesh M Raj demonstrated remarkable talent by securing the first prize at the "Uyarthum Karangal-Summer Fest 2024" and participating successfully in events like the NICHE-2025 organized by Noorul Islam University. He, along with DIVINE X, also won the third prize in the Group Dance (Western) competition held on April 5, 2024. Additionally, Shaun Isaiah E. excelled individually by winning the first prize in the Pencil Sketch competition on the same day. Beyond the Fine Arts Club, in the NCC division, NIBIN RAJ S. was honored at the state level by receiving the Tamil Nadu Government Scholarship for Outstanding NCC Cadets, along with a cash prize of Rs 5000, recognizing his commitment and excellence. These achievements reflect the students' vibrant participation and outstanding performances across different spheres in the institution.

Placement Success Story

The Department of Mechanical Engineering proudly shares the successful outcomes of recent campus recruitment drives. Our students have consistently demonstrated their skills and have been recognized by top organizations.

- Madras Engineering Industries Pvt. Ltd. achieved a 100% placement success rate by selecting all 55 participants.
- Pinnacle Infotech Solutions offered placements to 35 students, highlighting strong demand for core engineering profiles.
- Sri Sai Power Equipment's Pvt. Ltd. provided multiple opportunities across two drives, with a combined 35 selections.
- Schneider Electric Pvt. Ltd. showed impressive results, selecting 12 out of 14 participants.

- Just Dial Ltd. recognized the talent of our students with multiple selections across two recruitment drives.

The consistent success in placement drives reflects the department's commitment to academic excellence, industrial relevance, and the overall grooming of students for professional success.

We extend our hearty congratulations to all selected students and gratitude to our recruiting partners. Together, we continue building a future of excellence.

Summary Report on Completion of Online Courses for Credit Transfer

Twenty one students from the B.E. Mechanical Engineering program completed online courses during the academic year 2023-2024 (even semester) for credit transfer purposes.

Courses Completed:

- Metal Additive Manufacturing (noc23-ME92)
- Fundamentals of Automotive Systems (noc23-DE01)

Course Details:

- Both courses had duration of 12 weeks.
- The online courses were approved by the BoS, Dean-Academics and the Principal.
- Students obtained certificates from NPTEL.
- Grades were awarded according to Anna University norms.

The students successfully completed the online courses, fulfilling the academic requirements for credit transfer during the 2023-2024 academic year. The process was carried out in accordance with institutional and university norms, with all necessary certifications and approvals. This initiative supports the students' academic growth by integrating recognized online learning into their formal education pathway.