

DEPARTMENT OF MECHANICAL ENGINEERING

THE CRANK

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DEPARTMENT MAGAZINE

• Editorial Team •

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• Faculty Co-ordinators •

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ST JOSEPH ENGINEERING COLLEGE

MANGALURU-575 028

VISION

To be a value based Department committed to excellence in teaching and research, nurturing technically competent and socially responsible engineering professionals.

MISSION

- Providing state-of-the-art technical knowledge in Mechanical Engineering.
- Promoting research, education, and training in frontier areas of Mechanical Engineering.
- Facilitating faculty development through quality improvement programmes.
- Initiating collaboration with industries, research organizations and institutes for internship, joint research and consultancy.
- Instilling social and ethical values in students, staff and faculty through personality development programmes.
- Developing innovation in engineering and technology in order to provide beneficial service to the local community.

PROGRAMME EDUCATIONAL OBJECTIVES

- Graduates will engage in designing, manufacturing, testing, operating and/or maintaining systems in the field of Mechanical Engineering and allied industries
- Graduates will be able to communicate and perform effectively in both individual and team-based project environments including multi-disciplinary settings
- Graduates will apply knowledge and skills considering ethical practices, societal, economic and environmental factors and/or pursue higher education and research.
- Graduates will develop the practice of continuously updating with the latest knowledge and information in their field of specialization.

PROGRAMME OUTCOMES

Graduates of the Mechanical Engineering program are able to:

- Apply the basic knowledge of mathematics, science, thermal, design, and manufacturing engineering.
- Identify, formulate and solve mechanical engineering problems.

- Design a mechanical system that meets desired specifications and requirements.
- Design and conduct experiments, analyze and interpret data, and report results.
- Apply modern engineering software tools and equipment to analyze mechanical engineering problems.
- Apply engineering solutions in global and societal context.
- Understand the impact of engineering on society and demonstrate awareness of contemporary issues.
- Understand the professional and ethical responsibilities.
- Work in a team of core competence or multidisciplinary teams.
- Communicate effectively in both verbal and written forms.
- Apply financial and project management skills in their professional ventures.
- Demonstrate inquisitiveness, novelty in thoughts and zeal towards lifelong learning.

PROGRAMME SPECIFIC OUTCOMES

Graduates of the Mechanical Engineering program are able to:

- Gain competence to face various competitive examinations and succeed in seeking best opportunities in the corporate world and higher studies.
- Take up research programs on contemporary areas of mechanical engineering.



— *The Crank* Contents



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HOD's Message

Dear Esteemed Readers,

As Head of the Department of Mechanical Engineering, I am honored to inform you of some fascinating developments in our profession. I hope you will join me as we explore the current issue of our department's magazine and discover the achievements and activities.



I want to start by expressing my deepest gratitude to the hardworking faculty members, staff, and students in our department who have been expanding the limits of Mechanical Engineering. Their relentless pursuit of perfection has unquestionably improved our department's standing in the eyes of the public, both at home and abroad.

In this issue, we have included various pieces to highlight our faculty and students' innovative work and accomplishments. From renewable energy and automotive engineering to cutting-edge materials science and robotics, our academic members have contributed substantially to many different study areas. It gives me great pleasure to also acknowledge the outstanding work of our very brilliant students.

I would also want to thank our alums, whose unwavering enthusiasm and commitment have been important in the growth and development of our programme. Many of our alums have gone on to prominent positions in their fields, making groundbreaking contributions and expanding the bounds of possibility. Their success serves as an example to current students, demonstrating the breadth of possibilities and prospects available to them upon completion of their education.

Lastly, I sincerely appreciate everyone who helped make our department's magazine successful. We can release this book thanks to your undying enthusiasm, commitment, and support.

I wish you all an enlightening and inspiring reading experience!

Sincerely,

Dr. Shreeranga Bhat

Head of the Department of Mechanical Engineering

— Editorial

Dear Readers,

Greetings from the Mechanical Engineering Department! It is with great pleasure that we present to you the latest edition of our departmental magazine, The Crank.

In these pages, you'll find a testament to the relentless pursuit of knowledge that defines our department. The articles featured here not only showcase their dedication but also highlight the impact of mechanical engineering on diverse industries.

This magazine is a celebration of our collaborative spirit and the remarkable achievements of our department. You'll discover stories of students breaking barriers with their ingenious designs, faculty pushing the boundaries of research, and alumni leaving an indelible mark in the professional landscape.

As we navigate an era of rapid technological evolution, the role of mechanical engineering becomes increasingly vital. It is through the passion of individuals like you, who explore the intersections of science, creativity, and problem-solving, that we continue to make progress.

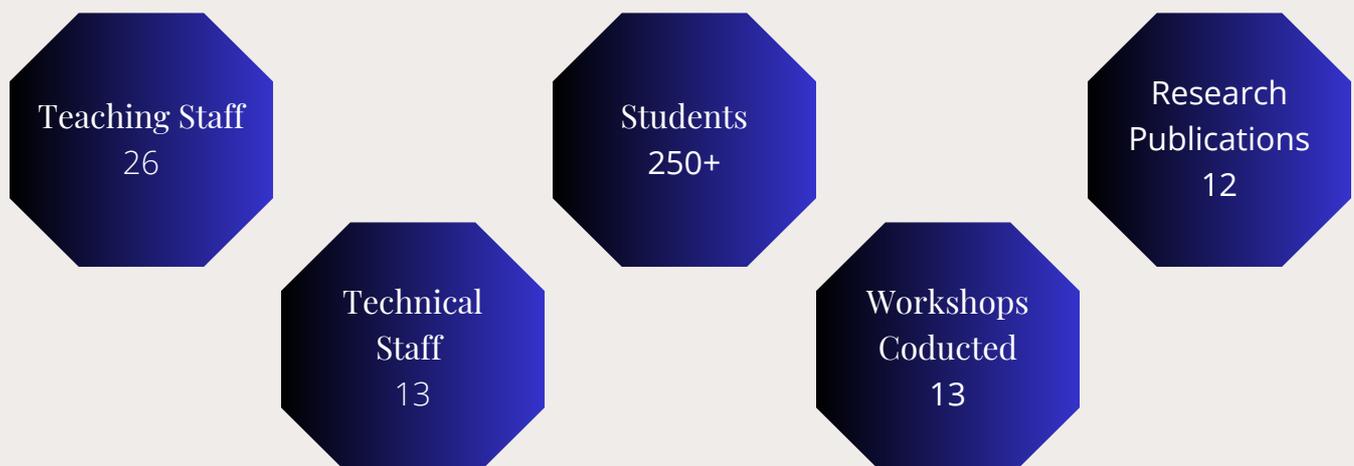
We invite you to immerse yourself in the world of mechanical wonders within these pages. Let the ideas shared here ignite your curiosity and inspire you to engage with the exciting opportunities that lie ahead.

Thank you for being a part of our journey. Happy reading!

Warm regards,

The Editorial Team

Department Stats



Workshops Conducted



The department of Mechanical Engineering in association with SJEC AICTE IDEA Lab and The Office of The Dean-Academics organized a five-day workshop on the "Internet of Things" from **26-30 September 2022**. A total of 31 SJEC staff participated in the immersive training. The resource people were from RVCE, Bengaluru.



The department of Mechanical Engineering organized a 2-week placement orientation program, "Prayathna-2022", from **6-14 October 2022** for final-year students. A total of 113 students participated in the training. The internal and external resource people conducted the sessions and training.



In association with SANJOSH- The SJEC Teaching Learning Centre (T.L.C.) and IQAC, the Department has conducted a Five-Day Boot camp for departmental faculty members on the 'Deployment of AICTE Examination Reforms and Outcome Based Education for Quality Enhancement' tentatively from **6-10 March 2023** everyday afternoon.



The Department of Mechanical Engineering organized an online webinar on "Intellectual Property Rights (IPR) & Patents and Design Filing" on **10 November 2022**. Dr Bharat N Suryawanshi, Assistant Controller of Patents & Designs, Rajiv Gandhi National Institute of Intellectual Property Management (RGNIPM) was the resource person.

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The Department of Mechanical Engineering organized an Industrial visit to BEML - Mysore for the Final and Third year students on **17 December 2022**. A total of 41 students visited the industry.



A placement celebratory meeting of all VII and V semester students on **29 December 2022** at 11:15 am in Bishop Aloysius Paul Hall, SJEC



The Department of Mechanical Engineering and the Institute of Engineers SJEC Chapter organized a three-day online Faculty Development Program on "Recent Advancements in Materials and Manufacturing (RAMM)" from **13-15 February 2023**. Prof. Kumanana S. (NIT, Trichy, TN; Topic: Sustainable Manufacturing), Prof. Benny Karunakar (IIT Roorkee, UK, Topic: Investment Casting Process), Prof. Samuel G. L. (IIT Chennai, TN, Topic: Smart Manufacturing), Prof. Somashekhar H. (IIT Chennai, TN; Topic: Micromaching), Prof. Mrityunjay D and Prof. Jagadeesh T. delivered sessions on various topics.



The Department of Mechanical Engineering organized a Parent-Teacher Meeting for III Semester students on **25 February 2022**.



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The Department of Mechanical Engineering, in association with AICTE IDEA Lab, organized and celebrated National Science Day 2023 on Tuesday, **28 February 2023**.



Conducted a Two-Day Workshop on "Modeling and Analysis of Mechanical Systems using MATLAB and Simulink" in association with ISTE-SJEC Chapter on **13-14 March 2023**. Mr Rakshioth B S (Senior application Engineer-UPT Technology solutions, CoreEL technologies Bengaluru) was the resource person.



Organized a refresher training program on pneumatics, electro pneumatics, and P.L.C. systems in the Festo Center for Industrial Automation from **1-3 March 2023**.

- The department of Mechanical Engineering organized a three-day workshop on "Engineering Modeling using SolidWorks" from **14-16 September 2022**. A total of 17 faculty members from the Mechanical and Civil Engineering Departments participated in the training. The resource people were Dr. Ravikanth Prabhu and Mr. Swaraj D Lewis.
- Conducted an Awareness Session on "Opportunities in Non-Destructive Testing" for the 3rd Year Mechanical Engineering Students on **1st April 2023** at Bishop Aloysius Paul Hall. Mr Ganesh and Mr Venkat from V&G Industrial Testing Laboratories Pvt Ltd were the resource persons.



FUN FACT

In 1938, engineers from DKW, one of the founding brands of today's AUDI AG, started conducting rollover tests with different DKW models in Colm, Germany, making it the first crash tests in automotive history

Achievements

Department: Mechanical Engineering

1) Total no. of Research Papers published by faculty in:

- a. National Journals: Nil
- b. International Journals: 12

2) Total no. of Papers presented by faculty at:

- a. National Conferences: Nil
- b. International Conferences: 10

3) Total No. of Conferences/Seminars/Workshops attended by the faculty: 118

Patents:

Granted: 1

Published: 1

Granted a patent by the Patent Office, Govt of India, for the "**Two Stroke Engine**" invention under application number 3152/C.H.E./2014 on 10 November 2022.



Dr Vijay V S
Asst. Prof.

Two projects selected for Faculty Project Program 2022

1. **Combined Wheelchair and Bed** by Dr Binu KG & Mr Yathish Kumar K – ME
Amount Rupees: 65,000

2. **Automated Rubber Tapping and Rubber Mixing Machine** by Ms Deepthi SR – ECE
Amount Rupees: 36000

Published in a patent journal by the Patent Office, Govt of India, for the invention "**Design of Electromagnetic Rail Gun for Aerospace Applications**" under application number 202241070716 A on 16 December 2022.



Mr Rajesh Belchada
Asst. Prof.

PhD Degree Awarded

PhD degree holders = 13

Faculty pursuing PhD degree = 7



Dr Rolvin S. D'Silva
Assoc. Prof.



Dr Pavana Kumara B
Assoc. Prof.



Dr Vijay V S
Asst. Prof.



Dr Canute Sherwin
Asst. Prof.

BE - Fourth Year



GOKUL PRABHU K.
4SO19ME034 | SGPA: 9.67



A.B. VIVEK NAYAK
4SO19ME001 | SGPA: 9.61



RACHANA K.S
4SO19ME080 | SGPA: 9.67

BE - Third Year



VIJAYESH M.T.
4SO20ME061 | SGPA: 8.68



JOSHUA LAWREN DSOUZA
4SO20ME014 | SGPA: 8.68



SUHANI P ANCHAN
4SO20ME058 | SGPA: 8.2

BE - Second Year



RYNOR GAWAIN PINTO
4SO21ME056 | SGPA: 9.55



SHAUN CLITUS DSA
4SO21ME061 | SGPA: 9.2



MOHAMMAD SHIFAN
4SO22ME413 | SGPA: 9.00

FUN FACT

Aerospace engineering can be traced all the way back to 1799. However, the first definition of aerospace engineering came about later in 1958. Robert Hutchings Goddard was the first official aerospace engineer.

— Sports



KARNATAKA TAEKWONDO ACADEMY KTA CUP-2022

Mr ABDUL MUKSHITH has participated in Group 8, Above 18 Years Kyorugi Category And has secured Gold Medal in the Championship held from **3rd to 4th December 2022** at Decathlon Anubhava and also secured BRONZE MEDAL UNDER 78Kg junior boys category.

— NCC



MOHIT K M along with SJEC college team secured winners in VTU Mangaluru division Hockey Tournament held at NMAMIT, Nitte on **11 November 2022**.

Cadet JOSHUA LAWREN DSOUZA and Cadet SREERAJ P of 6 Kar Naval Unit NCC passed the 'C' certificate Examination in the year 2023.

Cadet MOHITH K M of 6 Kar Naval Unit 2nd Batch passed the 'B' certificate Examination in the year 2023.

— Projects

Technova-2023, the final year project exhibition was held at SJEC, Mangaluru on **5th May 2023**.

Mr Gagan Shetty K, Asst. Professor, Department of mechanical Engineering, Sahyadri College of Engineering and Management (Alumnus of Batch 2011) and Mr Bharath Raj (Alumnus of Batch 2011) were the judges for the event.



Project Name: Design and fabrication of automated wagon stairs using scissor mechanism



Project Name: Design, Fabrication of Hydroponics-based Nutrient Film Technique (NFT) system.



Project Name: Design of a novel air handler unit for a solar based air conditioner.



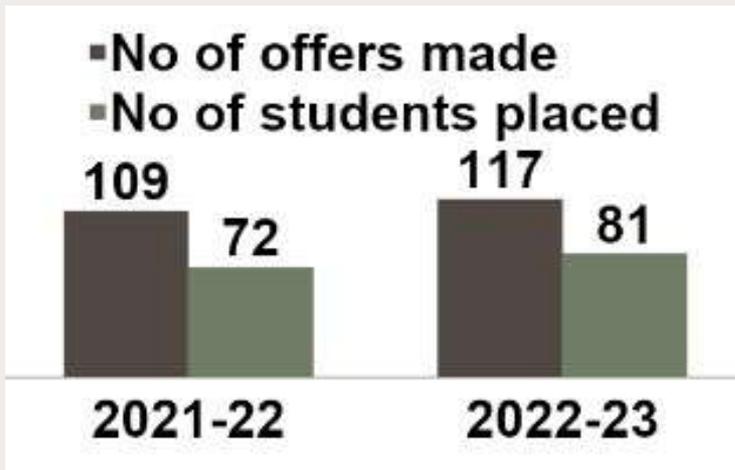
Project Name: Design and fabrication of Paddy-dust separating machine.



Project Name: Hand Rehabilitation



Mr Rudolf D'Souza - ME, Mr Nischal Naik - ME, Mr Nihal - EEE, Mr Prinson Pereira - EEE and Mr Deepak Suvarna - EEE got selected for Mahindra R&D Company through SAEINDIA BAJA placement drive 2022.



FUN FACT
 15.92% of all new sold cars in Brazil use ethanol as fuel, which is produced from sugarcane

— Automation and Robotics Club



Designed and Developed Attender Bot named **CURIO**



ARC-SJEC had participated in **Aerophilia**, a national level Techno-cultural fest held at Sahyadri College of Engineering Mangaluru from **November 11 to November 13, 2022**.

They competed in the Line follower, Robo Soccer and Tug of bot as a team of 10 and secured 1st place in Line follower.



ARC-SJEC participated in **Magnovite 2023**, a national level cultural and tech fest held at Christ College Kengeri Bangalore on **March 2nd and 3rd, 2023**.

Events:

Tech Trivia: A team of three, won first place.

Spark-A-Thon: A team of four, won first place.

C Talash: A group of two, won first place.

Business Analytics: Individual Participation and won second place.



ARC-SJEC took part in **Quantum 2022**, a national level tech fest held at New Horizon Engineering College Bengaluru from December 7 to **December 10, 2022**. They competed in the Robo Race, Robo Soccer, and Robo War as a team of six, and won first place in the Robo Race.

— **Team SJEC Racing**



Team SJEC Racing participated in SAEINDIA BAJA 2022 in the category of IC Engine Powered ATV.

— **Team eSJEC Racing**



Team eSJEC Racing won Overall Championship @ Mega ATV Championship 2022 at Goa and also procured an overall 8th position @ SAE eBAJA 2022 at Pithampur.



Team eSJEC Racing won Overall Championship @ ATV Championship 2023 at Pune and also procured an overall 9th runner up @ SAE eBAJA 2023 at Himachal Pradesh.

— **Team Terror Bull Robotics**



Excelled in following ROBOWAR competitions

- IIT Bombay
- IIT Madras
- IIT Warangal
- NIT Karnataka
- BITS Pilani
- Neighbouring Colleges

— **SJEC AERO**



Secured 2nd prize and emerged as top 2 all over India in FLUXUS in IIT INDORE in Aero Artistry

— Team Dynamic SJEC



Secured the 3rd place in the semi-finals of the Nasa hackathon which was organised in association with Nitte Meenakshi Institute of Technology, Yelahanka, Bangalore. The team consisted of Mohammed Zaid, Anusha Nayak, Sivani S S and Trisha Steeven. The hackathon was held online through google meet platform on **March 1st 2023** from 10am to 5pm.



Two student teams, Team Dynamic and Team Mercury participated in Smart India Hackathon 2022 grand finale at A D Patel Institute of Technology, Anand, Gujarat and Forge Accelerator, Coimbatore respectively. Team Mercury got selected for Incubation support by Forge to continue the project.

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FUN FACT

A typical car has around 30,000 parts, including the screws and bolts. But if you think that's a lot, you'll probably be surprised to learn that a 747-400 passenger airliner has a jaw-dropping six million parts. Of those six million parts, about half consist of fasteners.

— Team PlanetXS



Team planetXS has successfully taken part in the International Rover Design Challenge 2023 (IRDC) and have secured 19th Rank and also had held a talk with the Experts from NASA (National Aeronautics and Space Administration).



Group Captain Rhonston Soans Chief Engineering Officer, Indian Air Force (I.A.F) Station, Srinagar. Interacted with students on the topic " Life Lessons from a Soldier "Wednesday, 4th January 2023.



A final Farewell was given to the 4th year students through Torque association on 9th May 2023.



On 6th January 2023, engineering students of Third Year Mechanical Engineering from St. Joseph Engineering College, Mangalore visited the KARNATAKA GERMAN TECHNICAL TRAINING INSTITUTE (KGTTI)

Technical Article

Recent strides in 3D printing, functional inks, and artificial intelligence (AI) have ushered in a new era for patient-specific wearable devices and smart biomedical implants. Traditional ex situ printing has encountered challenges, leading to geometric and dynamic disparities



between printed materials and target surfaces. In situ 3D printing, empowered by AI, offers a solution, seamlessly adapting to evolving conditions, including dynamically morphing organs. This review explores the use of electronic and biological inks, indispensable for in situ 3D printing, while delving into AI-driven methodologies encompassing open-loop, closed-loop, and predictive control, ensuring real-time precision. Moreover, the integration of surgical robotics and AI is examined, underlining how these synergistic technologies fortify future 3D-printing applications. The amalgamation of AI, 3D printing, functional materials, and personalized biomedical devices holds immense promise for the future of smart manufacturing, enabling the creation of patient-specific wearables and biomedical implants with unprecedented accuracy and adaptability.

Alumni Message

We spoke to Jerin from the 2022 batch about his SJEC experience.



1. Reason behind enrolling for Mechanical Engineering at SJEC.

First of all SJEC is a well known college, here in mangalore. Their reputation draws people towards them. They earned the reputation through all the facilities they provide, beautiful campus, high diversity etc.

2. Your experience at SJEC.

Wonderful nonetheless. Most importantly my friends. Also I would not forget the cultural events they organized, which played a huge role in growing within the college. I'd love to mention all my friends, the m4 batch. Being in SJEC never meant that we had to stay away from sports or our hobbies. We had competitive matches within the college and sports day to declare the victories and so on.

3. Your success mantra.

I was always a last minute guy and would not recommend that to anybody. I've even been at the movies the day before an exam. It's just that, do what you do sincerely and always complete what you start.

4. Advice to your juniors

Enjoy the time being there. They become the good old times later on. Attend all the placement drives and keep updating yourself.

5. About life after engineering.

Do not worry about it. Your destiny will find you and you will reach where you are meant to.



Editorial Team



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