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DEPARTMENT OF MECHANICAL ENGINEERING

(Accredited by NBA)

The Department of Mechanical Engineering at Christ College of Engineering aims to be a leading knowledge hub in the country, dedicated to producing industry-ready engineers through comprehensive mentoring, training, and top-notch facilities. Our vision is fueled by a commitment to excellence, backed by state-of-the-art infrastructure, industry-standard equipment, and a team of highly qualified faculty members trained in renowned institutes. We prioritize practical learning by offering hands-on experience with design and analysis software like CATIA, ANSYS, CFD, AutoCAD, Onshape, and CNC programming. Our curriculum is designed to equip students with industry-relevant skills, ensuring they are prepared to tackle real-world engineering challenges.

To foster a culture of innovation and leadership, we encourage our students to participate in national and international competitions, hackathons, technical fests, and co-curricular activities. Our flexible program allows students to tailor their education to align with their career aspirations, emphasizing interdisciplinary projects and collaborations.

We have established partnerships with professional bodies like SAE, ASME, and PMI to guide our students in understanding international standards and addressing societal issues. These collaborations, along with our industry-focused labs and MoUs, bridge the gap between academia and industry, ensuring high placement rates and consistent academic success.



At the Department of Mechanical Engineering, we are shaping the future of engineering by nurturing talent, fostering innovation, and preparing students to excel in the dynamic world of mechanical engineering.

Real Persistent Mechxians (RPM) emerged from the fervent ambition of the Mechanical Engineering Department to create a unified platform, fostering togetherness by consolidating all cultural and technical endeavors. In its impressive 6-year journey, RPM has blossomed into a well-structured association, setting the pace and securing its distinguished position among the top-ranking entities within our college. The heartbeat of college events, RPM has consistently spearheaded major initiatives, drawing massive crowds and amassing an ardent local fan base. Its magnetic pull extends beyond numbers; RPM has become synonymous with a close-knit community within the Department of Mechanical Engineering, nurturing an inviting and familial atmosphere. At the epicenter of RPM's meteoric rise stands Maschinen Fest, an annual extravaganza that epitomizes the association's essence – a dynamic fusion of creativity, innovation, and collective wisdom showcased within the captivating world of mechanical engineering.



Rev. Fr. John Paliakara CMI Executive Director

At the very outset let me congratulate the Department of Mechanical Engineering for getting accredited by the National Board of Accreditation (NBA) with a score of 605. This is indeed a momentous achievement which will act as a catalyst for the next phase of development that this department needs to undergo. I look forward to an exciting and at the same time challenging future and I have the strong belief that the Mechanical Engineering Department will be focused on providing the best exposure to its students which in turn will ensure that the students turn out to be competent and confident professionals.



I am happy to note that our Mechanical Engineering students are excelling in SAE national level competitions, but it is a bit disappointing that these opportunities are not translating into internships or job offers. The Part-time job challenge is again a novel initiative from this department and I hope that such initiatives meet their intended results.

I extend my wishes to all the readers of this magazine. May the Mechanical Engineering students turn out to be as vibrant as the pages of this magazine.

Rev. Fr. Joy Payyappilly CMI Joint Director



Get Ready for the Ride! Mechanical Engineering at Christ College of Engineering is set to rock your world in the 7th Edition of department magazine 'INFINITY' brought to you by the Department Association, RPM. Think Elon Musk vibes – we are not just pushing boundaries; we are rewriting the playbook for the modern era. Envision a blend of tech brilliance and imagination, where gears aren't just parts; they are the architects of a new age. The team of faculty and students is on a mission to redefine innovation, turning challenges into our playground.

Gear up for an exhilarating tour of Christ College of Engineering - where Mechanical Engineering meets the future in the most attractive, captivating, and relevant way possible through INFINITY.

Dr. Manoj George

Director (Academics)



I am thrilled to witness the launch of the Mechanical Engineering Students Magazine. This endeavor showcases the dedication, passion, and exceptional talents within our mechanical engineering community. The magazine's focus on achievements, insights, and creative endeavors emphasizes the importance of technical writing in our field. Effective communication is integral to engineering, and this platform provides a valuable opportunity for students to hone their skills. It's not just about articles; it's a canvas for expressing creativity and sharing experiences. I commend the magazine team for their hard

work and look forward to exploring the rich content that reflects our collective brilliance and innovative spirit.

Dr Sijo M T

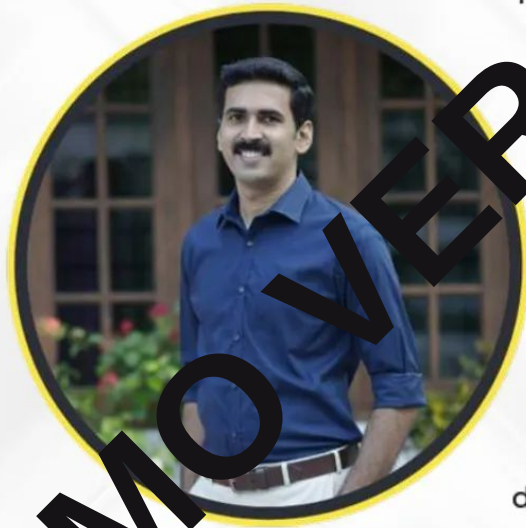
HOD ME

I am delighted to extend my heartfelt congratulations to the entire team on the successful publication of the seventh edition of our technical magazine, INFINITY. This achievement is a testament to the hard work, dedication, and passion that our department embodies. The latest edition reflects the creativity, knowledge, and expertise of our community in mechanical engineering, contributing significantly to the academic realm. Your commitment to excellence sets a remarkable example for all. I am proud of each one of you for your contributions and efforts. Let's continue to inspire and pave the way for future successes, making our institution proud. Congratulations once again, and let's look forward to more achievements ahead!



Roshan David

Staff Editor



I am excited to be a part of our very own Mechanical Engineering Department magazine, Infinity 7.0, showcasing the incredible talent, innovation, and achievements within our department.

The magazine will surely serve as a platform to highlight the diverse range of research endeavors, project successes, student accomplishments, and faculty expertise that define our community. Through this publication, we aim to foster collaboration, inspire creativity, and celebrate the contributions of each member of our department.

We believe that every story, every project, and every idea has the power to inspire and educate. Whether you're a seasoned researcher, a budding engineer, or a passionate student, your voice matters, and we have tried to amplify it through our magazine.

Congratulations to the student team for creating a vibrant and engaging publication that reflects the spirit of excellence and innovation that defines our Mechanical Engineering Department.

Thank you team for your enthusiasm and support on this exciting endeavor.

Aalwin Sussan

Chief Editor

Welcome to Infinity 7.0, the latest edition of our department magazine! Each issue aims to capture the spirit of our community – a vibrant mix of creativity, intellectual curiosity, and unwavering dedication. This year, we've surpassed expectations with insightful articles, captivating artwork, and profiles of our rising stars. It's a testament to the diverse talents that fuel our department.

A heartfelt thank you to everyone who made this possible – The Executive Director, The Principal, The HOD, esteemed faculty, and all our friends. Your collaborative spirit has transformed a dream into a resounding success. As you delve into Infinity 7.0, embark on a journey of discovery, inspiration, and perhaps even a spark of your own imagination.



Rev. Fr. Milner Paul CMI Joint Director

I am happy to know that mechanical department of Christ College of Engineering is bringing forth the magazine "Infinity 7.0". It portrays students activity based learnings, out reach programmes, artistic productions and so on and so forth. It certainly fosters their creative space and they may be more productive and progressive to be a contributors to this society. I also congratulate all the creative heads and all committee members who has actualized it. Wish you all the success. May God bless you.



Dr. Sajeesh John Principal



It is really a matter of pride to pen a few words for this issue of the Mechanical Engineering - Departmental Magazine. This effort of the budding Mechanical Engineers comes immediately after the achievement of NBA Accreditation for all the 5 undergraduate programmes of Christ College of Engineering, including the Department of Mechanical Engineering. Along with the Staff, many students have contributed to this success story. I express my sincere appreciation for all the staff members, students and alumni of this department on this momentous achievement.

Along with the Faculty members and staff, I too wish to see all the students blossoming into seasoned and tenured professionals in their chosen career path after they graduate from CCE. May God Almighty bless all your efforts in the realization of this dream. May this department continue to march ahead with new initiatives that will make the student community to improve and grow together.

My best wishes for this magazine and my congratulations to everyone behind this venture. My heart also goes out to those who contributed towards this magazine.

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Dr. John V. D. Vice Principal

I am happy to note that the Department of Mechanical Engineering is releasing the 7th edition of its Annual Department Magazine - Infinity. At the outset, my congratulations to the department on getting NBA Accreditation. The time and effort put in to achieve this accreditation is huge. May this department continue to blossom under the able leadership and guidance of all departmental faculty members. Enriching and enlightening the students with the relevant knowledge and skill set is one of the strengths of this department. I am sure that with the excellent academic environment in place here, the faculty members will be able to inspire the students to develop their technical skills and inculcate the spirit of team work in them. I hope that this magazine will be a catalyst in the realization of this goal. Best Wishes!!!



Dr. Elizabeth Elias Director (Research)



Magazine is an important medium of communication at educational institutions, enabling students to express themselves, showcase the talents of students and faculty and build a strong sense of community among students, faculty and parents.

I understand that the Mechanical Engineering Department is trying to excel in every initiative that they undertake. They do their level best to discover and bring out the hidden talents lying dormant in each and every student.

I wish the magazine a journey of success, achievements and triumph!!!

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VISION

To become a recognised knowledge hub in Mechanical Engineering by moulding professionally competent and socially responsible engineers.

MISSION

To create a conducive learning platform for students to excel as professionals, through quality technical education and training.

- To involve students in socially committed projects and programs to broaden their knowledge and integrity.
- To mould students with good leadership qualities, ethical values and life-long learning.



PROGRAMME SPECIFIC OUTCOMES (PSO)

- Apply the knowledge of thermal sciences, mechanical design, and manufacturing principles for analysing and evaluating problems in the domain of Mechanical Engineering.
- Apply the knowledge gained through multidisciplinary learning, to solve real life problems.
- Effectively use modern technology tools such as CFD, CAD/CAM and 3-D printing in Mechanical Engineering practice.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

- Apply technical knowledge and skills to find feasible solutions in Mechanical Engineering domains and allied industries.
- Evolve as responsible professionals capable of solving socially relevant problems and pursue higher education and research.
- Exhibit professionalism, team work, and ethical attitude through continued learning to accomplish organisational goals.

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∞ INFINITY EDITION 7



911

Evolution of the Porsche 911.

METaverse

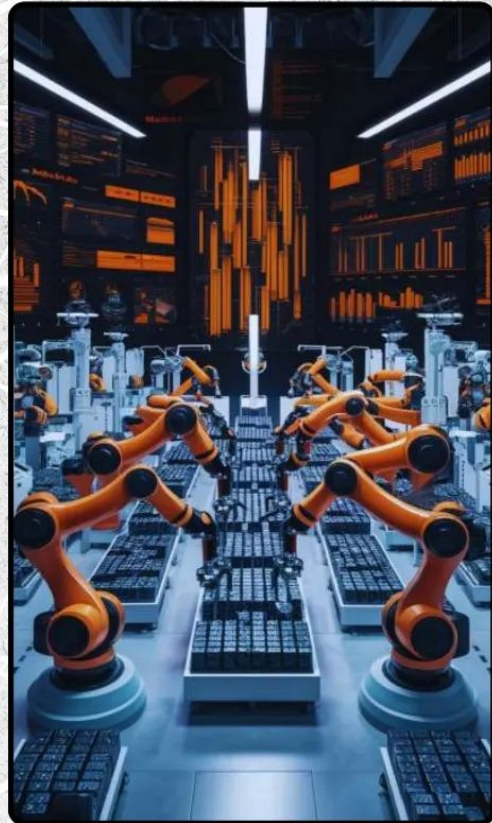
Dive into the Metaverse: Exploring the Digital Frontiers of Connectivity, Creativity, and Community.

RAPID PROTOTYPING

Embracing Rapid Prototyping to Accelerate Design and Development Processes.

KARL BENZ

Unveiling the Legacy of the Father of the Automobile.



ROBOTICS AND AUTOMATION

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MATLAB

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COMPOSITE

Revolutionizing Industries with Lightweight Strength and Versatility.

FUNCTIONALLY GRADED MATERIALS

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JEFFIN FRANCIS
ME 21-25

THE EVER LIVING ICON



For over 50 years, one car has been the world's benchmark. The standard to which every sports car is measured.

The Porsche 911 has always been the epitome of automotive excellence, and no matter what year it's from, and no matter how old, it's one of the best there is, and the best there ever will be.



GEN: 1 - '911' original (1963-1973)

After Switching their company from automotive consulting and racing to automotive production, Ferdinand Porsche an engineer, largely responsible for the VW Beetle, along with his son Ferry Porsche designed the Porsche 356 in 1940 whose design was based on that of a Beetle. After its great success, Porsche decided to produce a new model, the 901. Which is later renamed 911. A more practical version of the 356, the 911 marked a great leap in sports car history. It ditched the 4 cylinders from the 356 and was equipped with a 2 liter 6-cylinder boxer engine producing 130hp.



The 911, despite being a sports car, was more practical since it had four seats. The 911 debuted in 1963 and it became a sensation due to both its performance and practicality.

GEN: 2 - 'G-series' (1973- 1989)

With their great success both on road and track. Porsche released the 911 Carrera RS marking its 10-year anniversary.

It had a 2.4l boxer 6 cylinder producing 210 HP and was the first ever production car to come with a rear spoiler. Today they are considered by many to be the greatest 911 ever made.



In 1975 Porsche released the 911 turbo internally called the 930. The 930 was one of the very first sports cars to use turbocharging technology and with 260 hp it was the fastest car in the German auto industry during that period. It was so ahead in performance that it was called the 'WIDOWMAKER'.

GEN: 3 - '964' (1989- 1994)

In 1989 Porsche completely revised the 911 with a new design, internally called the 964, the new 911's styling was a natural development from earlier models, yet its chassis, engine and drivetrain were brand new.

In 1989 Porsche completely revised the 911 with a new design, internally called the 964.



the new 964's styling was a natural development from earlier models, yet its chassis, engine and drivetrain were brand new. It came with an air cooled 3.6-liter boxer engine producing 250hp. Enhanced upgrades such as ABS brakes, air bags and a 4-wheel drive system were visible in this model.

GEN: 4 - '993' (1994- 1998)

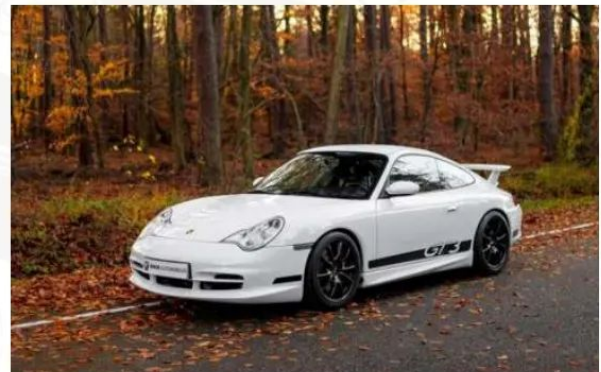


993 arrived just 5 years after 964 and for many the 993 is the best-looking Porsche ever made. With the 993, Porsche upgrades from a single turbo to a twin turbo which delivered around 400hp. The 993 was also the first 911 to receive a 6-speed transmission. With the end of the Porsche 993 in 1999 Porsche decided

to switch from air cooled engines towards liquid cooled engines. And so, the 993 was the last generation of the 911 to have an air-cooled engine.

GEN: 5 - '996' (1998- 2004)

The 996 was the first 911 to be driven by a water-cooled engine. With the 'teardrop' headlight design and soft styling the 996 had a completely different design when compared with its previous generations. Porsche moved towards the 21st century giving priority to vehicle performance and with the release of the 996 GT3 and the GT2, Porsche started taking their racing spec cars and designed them for the road. The new GT cars were lighter, harder and more powerful when compared to the normal 911s.



GEN: 6 - '997' (2004- 2011)

All 997 models had more than 300 HP, while the GT2 had close to 530hp. With improvements in design and performance Porsche released the GT3 RS, a car stripped of non-essentials like rear seat, sound insulation and AC, making it a proper race car for the road.

The GT3 RS, in manual gearbox form, is considered to be one of the best driver's cars of all time. The GT2 RS that followed was even lighter than the GT3 and it became the first to break the 320 kmph top speed. The 997 is also the most produced 911 model.



GEN 7 - '991' (2011- 2018)

With its sleek and aerodynamic design, Porsche focused on improving the car's efficiency without sacrificing its iconic design. The '991' consisted of a number of new features and innovations including a torque vectoring system, active suspension management and four-wheel steering. The GT2 RS, introduced during this period, became one of the fastest Porsches ever, reaching 0-60mph in just 2.7 seconds. It still holds its place among the fastest cars to go around the Nürburgring.



GEN 8 - '992' (2018 onwards)

The eighth generation of the 911, the 992 was first launched in 2019. The 992 had major upgrades in both technology and performance. Porsche released the 992 GT3 RS in 2022, a more track focused 911 with a large spoiler and air vents that aid in performance. The GT3 RS has also marked history by being the first 911 to have a Drag reduction system (DRS).



Spanning over 6 decades of automotive excellence, performance and style, over 1 million Porsche 911 models have been made. The 911 remains a symbol of Porsche's unwavering commitment to pushing the boundaries of automotive engineering while staying true to its iconic heritage. A family car, a sports car, a super car, an absolute legend, all under one name. The Porsche 911 is the most iconic sports car in the history of the world.

RAPID PROTOTYPING

ARUN C RAMESH
ME 21-25

HOW DESIGN THINKING COMPANIES APPLY **RAPID PROTOTYPING?**

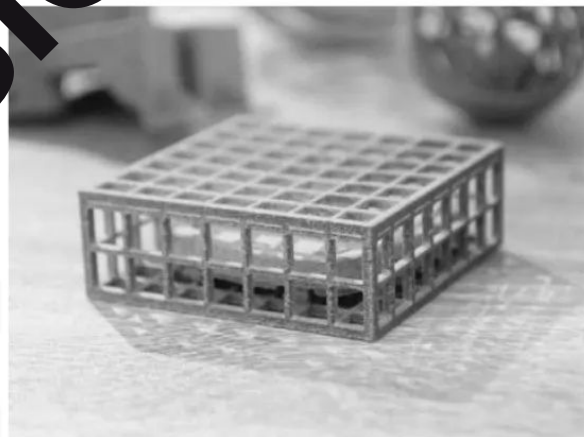
Design thinking companies are always looking for new and innovative ways to improve their products. One of the best ways to do this is through rapid prototyping. This process allows you to quickly develop a prototype of your product, test it out, and make changes based on feedback. In this article, we will discuss how design thinking companies apply rapid prototyping and how it can help improve your new ideas and product development process!

Rapid prototyping is a way to create a prototype of your product quickly and efficiently. The goal is to get feedback early and often so that you can make changes to your design before it goes to production. This process can be especially helpful when you're developing a new product or service, as it allows you to test out your ideas with real users.



There are a few different ways to create prototypes, but the most common method is to use software like Figma or Sketch.

Stage 1:
Concepting, Initial Prototyping, &
Product Feasibility
Stage 2:
Engineering Validation Tests
Stage 3:
Design Validation Tests
Stage 4:
Manufacturing Pilots
Stage 5:
Manufacturing Pilots



There are plenty of ways to communicate and test new ideas during your product development. No matter if you're creating sketches of your concept - or building a clickable prototype with software. Every project can benefit from the expertise of a Design thinking company by including the market when designing solutions.



In Design Thinking, rapid prototyping is used as a way to test out ideas and get feedback from users. This process allows you to quickly create a prototype of your product, test it out, and make changes based on feedback.

One of the most common mistakes is the failure to iterate. Rapid prototyping revolves around iteration, making it crucial in Design Thinking. Maintaining an iterative process is vital. Continuously test and refine your product according to the insights gained from interviews. In summary, embrace rapid prototyping. It has greatly benefited Design Thinking companies and could do the same for you!

KARL BENZ-FATHER OF AUTOMOBILES

JOHN DEVIS THATTIL
ME 22-26

“The best or nothing. In the past, present and future.”



Karl Benz was a German engineer and inventor who is credited with the creation of the first practical automobile powered by an internal combustion engine. Benz was born on November 25, 1844, in Mühlburg, Germany. He studied at the University of Karlsruhe and later worked as a mechanical engineer. Benz's first great achievement was his stationary gasoline two-stroke engine. He was inspired by the work of an earlier German engineer, Nikolaus Otto, who created the first four-stroke engine in 1861. Benz received a patent for his invention in 1880 and went on to add improvements such as an engine speed regulation system and ignition via a battery system.

This new device of Benz managed to garner interest from banks and businessmen who wanted to invest. Because he needed the capital to grow his company, Benz converted his business into a joint-stock company named Gasmotoren-Fabrik Mannheim in 1882. This did not work out as he hoped it would. After all the agreements were completed, Benz ended up only owning five percent of the company. More importantly, he did not have a say in how the business was run, anymore. Not a significant one, at least. His partners had differing notions on what products to design and sell and the engineer's ideas often went ignored. Not happy with this arrangement, Karl Benz left the corporation the following year.



Karl Benz (in light suit) with family and friends on an outing in one of his automobiles, c. 1894

A Visionary Wife and a Daring Plan

Kari Benz may have built the first horseless carriage, but the road to automotive success wasn't a one-man show. Enter Bertha Benz, a woman whose vision and courage propelled the Benz Patent Motorwagen from a novelty to a revolutionary force. Sales were sluggish, and public doubt lingered. But Bertha, with a spirit as audacious as the road ahead, saw the potential waiting to be unleashed.

66 Miles that Changed History: Pioneering Journey

In 1888, Bertha embarked on a groundbreaking long-distance trip, defying societal norms and her husband's

expectations. Her destination: Pforzheim, a challenging 66 miles away, wasn't just a leisurely Sunday drive.

Imagine Bertha navigating a world without gas stations, relying on pharmacies for rudimentary fuel and the ingenuity of a blacksmith and cobbler to overcome breakdowns.

Resourcefulness at its Finest - Hairpins and Garters to the Rescue.

The journey was a testament to Bertha's resourcefulness. A leaky fuel line found an ingenious patch: her garter. Clogged valves were coaxed back to life with the help of her hairpins. Each hurdle, from unreliable roads to mechanical woes, became an opportunity

for her to showcase her unwavering determination.

A Triumphant Arrival and a Legacy Forged

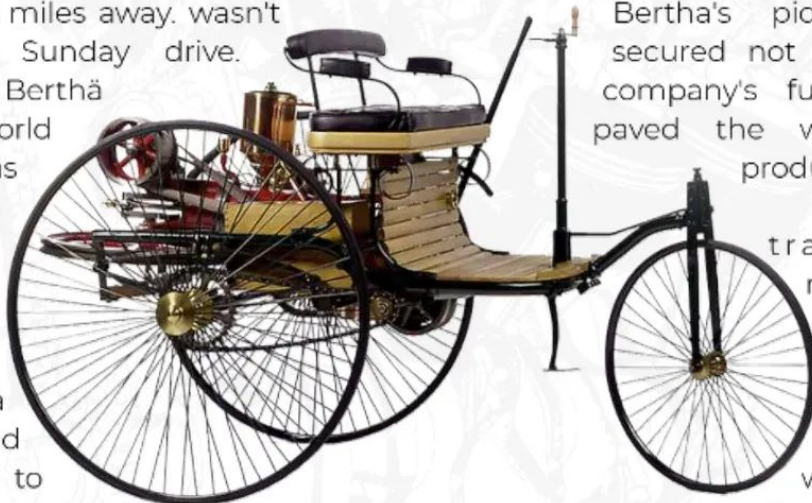
After a grueling yet triumphant 12-hour odyssey, Bertha and her sons arrived in Pforzheim. Their audacious feat became a global sensation, shattering skepticism and igniting public interest in the automobile. This wasn't just a family adventure; it was a turning point for the automotive industry.

More Than Just Reaching a Destination: Paving the Way for a Transportation Revolution

Bertha's pioneering spirit secured not only the Benz company's future but also paved the way for mass production and a

transportation revolution. Her drive, both literal and figurative, reshaped the world, etching her name forever

in automotive history.



Engine of the first Patent Motorwagen, presumably from the replica

ROBOTICS AND AUTOMATION

ANANDHAKRISHNAN KL
ME 21-25

Robotics and automation are transforming industries, and their impact is undeniable. From factory floors to farms, these technologies are enhancing efficiency and challenging traditional methods. Let's explore their rise, applications, and the future they hold.

Robots Take Center Stage

Robotics, fueled by advancements in AI and sensors, has brought intelligent machines to life. These robots are no longer confined to science fiction; they're performing complex tasks with precision in manufacturing, healthcare, and beyond. Companies like Tesla leverage robots to streamline production, boosting both productivity and profits.

Automation-The Efficiency Engine

Automation, the broader concept of using technology for tasks with minimal human input, encompasses robotics and extends further. Imagine driverless vehicles in transportation or robotic process automation (RPA) handling repetitive tasks in offices.



The finance sector utilizes AI-powered algorithms for fraud detection and risk assessment, streamlining processes and improving accuracy. Agriculture is employing sensor-equipped drones to monitor crops, optimize irrigation, and identify pest infestations, leading to higher yields and resource conservation.

Challenges and the Road Ahead

While robotics and automation offer immense benefits, concerns about job displacement, ethics, and cybersecurity linger. However, proponents argue that automation creates new opportunities, fostering innovation and economic growth.

The key lies in preparing the workforce for the future. Education and reskilling initiatives are vital to equip individuals with the skills needed to thrive in an automated world. Skills like data analysis, programming, and problem-solving will become increasingly valuable. Collaboration between governments, businesses, and educational institutions is crucial to ensure everyone has the tools to succeed.

A Glimpse into the Future

The potential applications of robotics and automation are boundless. In healthcare, robots assist with surgery, provide care to the elderly, and even deliver medications. Space exploration utilizes autonomous rovers, paving the way for human space colonization.

The convergence of robotics with 5G, the Internet of Things, and blockchain will unlock further possibilities. Imagine smart factories with interconnected machines optimizing production in real-time, or smart cities leveraging automation for sustainability and improved quality of life.

As we stand at the threshold of a new era shaped by robotics and automation, it's crucial to embrace these technologies responsibly. Through collaboration, innovation, and ethical considerations, we can harness their potential to build a brighter future for all.

APPLICATION OF MATLAB IN MECHANICAL ENGINEERING

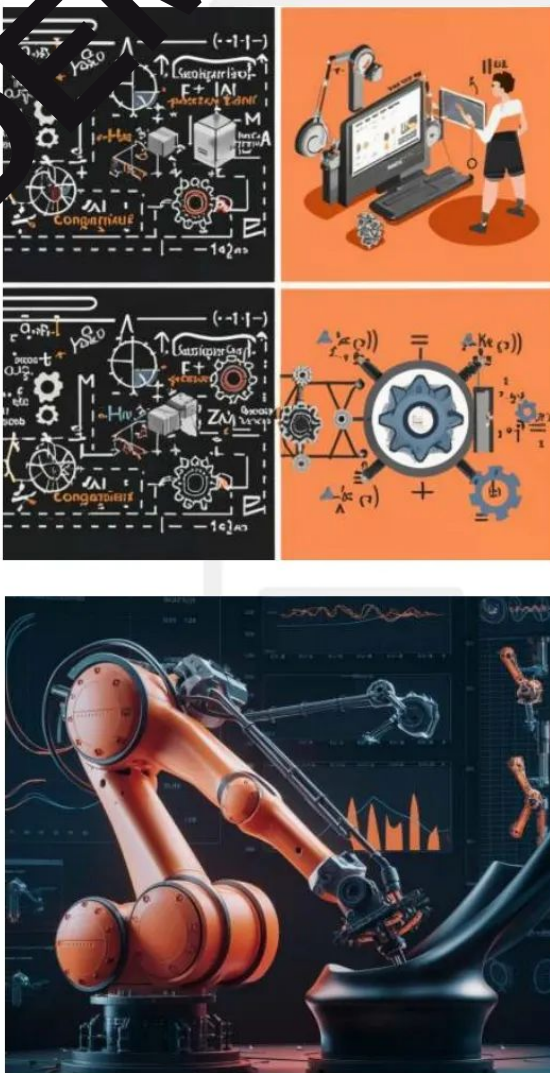
VISWANATH K KAIMAL
Asst. Prof. MED

For mechanical engineering students and professionals, mastering essential software tools is crucial. These programs streamline design, analysis, simulation, and project management tasks. Among this vast software landscape, MATLAB stands out as a cornerstone.



THE POWER OF MODELING AND SIMULATION

At the core of MATLAB's utility lies its modeling and simulation capabilities. Engineers leverage its robust numerical computation to develop precise mathematical models of mechanical systems. These models can represent anything from the intricate heat transfer within a car engine to the complex vibrations of a skyscraper during an earthquake. MATLAB doesn't shy away from the complex equations governing these phenomena, allowing engineers to analyze and predict behavior with remarkable accuracy. Simulink, a companion software, takes this a step further by enabling the creation of dynamic system models using intuitive block diagrams. This visual approach streamlines the modeling process, making it accessible to engineers of all experience levels, and fostering a deeper understanding of how different components interact within a mechanical system.



OPTIMIZING FLUID FLOW: MATLAB AND CFD

Computational Fluid Dynamics (CFD) plays a vital role in analyzing and optimizing fluid flow. MATLAB, coupled with the CFD toolbox, tackles aerodynamics, hydrodynamics, and heat transfer problems. Engineers can model complex scenarios, predict pressure distributions, and optimize designs for superior performance and efficiency. Parallel computing capabilities further expedite simulations by leveraging multicore processors and GPUs.



STRENGTH IN NUMBERS - MATLAB AND FINITE ELEMENT ANALYSIS

Finite Element Analysis (FEA) is a cornerstone technique for analyzing structural integrity, thermal behavior, and fluid dynamics. MATLAB, in conjunction with specialized toolboxes (PDE and FEA), facilitates the development and solution of finite element models. Engineers can predict stress distributions, thermal

gradients, and fluid flow patterns within components, aiding in design optimization. Virtual experiments conducted within MATLAB enable iterative design refinement.



DATA ANALYSIS AND VISUALIZATION, EXTRACTING INSIGHTS

Data analysis and visualization are crucial aspects of mechanical engineering. MATLAB tackles vast datasets from experiments, sensors, or simulations. Its rich suite of functions facilitates data manipulation, statistical analysis, signal processing, and image processing. Engineers can extract valuable insights from raw data, informing design and optimization. Furthermore, MATLAB's visualization capabilities create informative graphs, charts, and animations to effectively communicate findings.

THE FUTURE OF ENGINEERING AI INTEGRATION



As technology evolves, so does MATLAB's utility. Machine learning and artificial intelligence (AI) capabilities are being integrated. Engineers can leverage machine learning algorithms for predictive maintenance, fault detection, and optimization. MATLAB's deep learning toolbox enables the development and deployment of neural networks for tasks like image recognition and control. By integrating AI, engineers can enhance autonomy, efficiency, and adaptability in mechanical systems.



CONCLUSION

MATLAB stands as a linchpin in mechanical engineering, offering a rich tapestry of tools for innovation, design, and optimization. From modelling and simulation to data analysis, optimization, and beyond, MATLAB serves as a versatile platform for tackling numerous challenges. As technology advances, MATLAB is poised to remain at the forefront, driving progress and pushing the boundaries of what's possible in mechanical engineering.





ABHINAV K BINOI
ME 23-27

Exploring the Cutting-Edge World of Composites: Innovations Across Various Matrix Materials

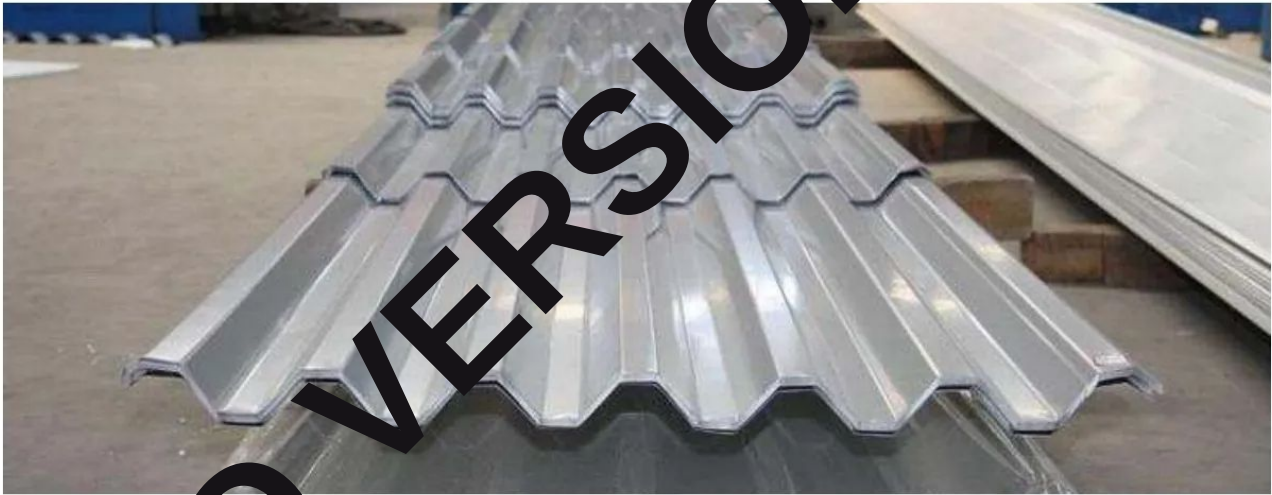
In today's era of advanced engineering and material science, composites have emerged as the cornerstone of innovation across industries. Composites, amalgamations of different materials, offer superior properties compared to their individual constituents. Let's delve into the diverse landscape of composites, spanning metal, polymer, ceramic, hybrid, natural fiber, and nano composites.

Metal Matrix Composites (MMCs) represent a pioneering field where metal matrices are reinforced with ceramic, carbon, or other materials. This blend results in enhanced mechanical properties, such as high strength, stiffness, and thermal conductivity.

MMCs find applications in aerospace, automotive, and sporting goods industries due to their lightweight nature and exceptional performance under demanding conditions.

Polymer Matrix Composites (PMCs) have gained widespread recognition for their versatility and adaptability. PMCs consist of a polymer resin matrix reinforced with fibers like carbon, glass, or aramid. These composites offer a remarkable strength-to-weight ratio, corrosion resistance, and design flexibility. From aerospace components to automotive parts and sporting equipment, PMCs continue to redefine manufacturing standards.





Ceramic Matrix Composites (CMCs) epitomize the fusion of advanced ceramics with other materials to achieve unparalleled properties. CMCs boast high-temperature resistance, exceptional mechanical strength, and thermal shock resistance. These attributes make them indispensable in aerospace propulsion systems, gas turbines, and industrial machinery, where performance under extreme conditions are non-negotiable.

Hybrid Composites represent the convergence of two or more types of reinforcements within a single matrix material. By strategically combining different materials, hybrid composites can achieve a balance of properties tailored to specific applications. These composites are finding increasing utility in automotive structures, renewable energy infrastructure, and marine applications, where a blend of strength, durability, and lightweight characteristics are paramount.

Natural Fiber Composites (NFCs) have gained traction as eco-friendly alternatives to conventional composites. NFCs employ natural fibers such as jute, hemp, or flax as reinforcements within a polymer matrix. Apart from being renewable and biodegradable, NFCs offer competitive mechanical properties, low cost, and reduced environmental impact. They find applications in automotive interiors, construction materials, and consumer goods, catering to the growing demand for sustainable solutions.



Nano Composites represent the cutting edge of composite materials, leveraging the extraordinary properties of nanoparticles. By incorporating nanoparticles into the matrix, nano composites exhibit exceptional strength, stiffness, electrical conductivity, and thermal stability. These materials are revolutionizing fields like electronics, biomedical devices, and structural engineering, where precise control over material properties is critical for performance optimization.

In today's world composites continue to push the boundaries of material science, driving innovation across various industries. Whether it's Metal Matrix Composites, Polymer Matrix Composites, Ceramic Matrix Composites, Hybrid Composites,



Natural Fiber Composites, or Nano Composites, each category offers unique advantages and applications. As research and development efforts intensify, the future promises even more groundbreaking advancements in composite materials, shaping a world where performance, sustainability, and efficiency converge seamlessly.

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Opening Doors...

Getting a German Masters in Mechanical Engineering

Germany with its robust economy, reputed colleges, and booming industrial sector make it a desirable location for ambitious engineers everywhere. Besides, mechanical engineering is a unique discipline owing to its relevance within the industrial environment of Germany.

Students aspiring to advance their careers and achieve engineering excellence can unfold a world of opportunities by pursuing a Masters in Mechanical Engineering here.



ACADEMIC PROMINENCE

German academic institutions are renowned for their rigorous standards and emphasis on experiential learning. The industry-relevant curriculum and cutting-edge research are the hallmarks of the German education system and specialized degrees cater to different interests within specific areas. The Technical University of Munich, RWTH Aachen University, and the University of Stuttgart frequently rank among the top global institutions for mechanical engineering.

CAREER PROSPECTS

Mechanical engineers can avail a myriad job options within Germany's robust industrial sector, which is renowned for innovation and technical expertise. Employers highly value the skills and knowledge garnered during the Master's program irrespective of the industry—automotive manufacturing, renewable energy, robotics, or aerospace.



INTEGRATION OF INDUSTRIES

Numerous institutions have close partnerships with industry leaders like BMW, Siemens, and Bosch, thus granting students access to research projects and internships, besides jobs after graduation. This integration between industry and academics not only improves the curriculum's practical relevance but also gives students access to networking opportunities.

ENRICHMENT OF CULTURE

Studying in Germany offers opportunities galore for both holistic development and academic pursuits. The wide range of cultural experiences amid Germany's historical cities and gorgeous landscapes contribute to a well-rounded education that extends beyond the boundaries of the classroom.



ACCESSIBILITY AND RESOURCES

Germany offers a genuinely worldwide experience, with a welcoming environment for students from diverse cosmopolitan backgrounds. The course can be surprisingly economical with little or no tuition fees, which makes it a desirable choice for students, without having to worry about taking on large loans. Also, fellowships and scholarships are offered exclusively to overseas students.

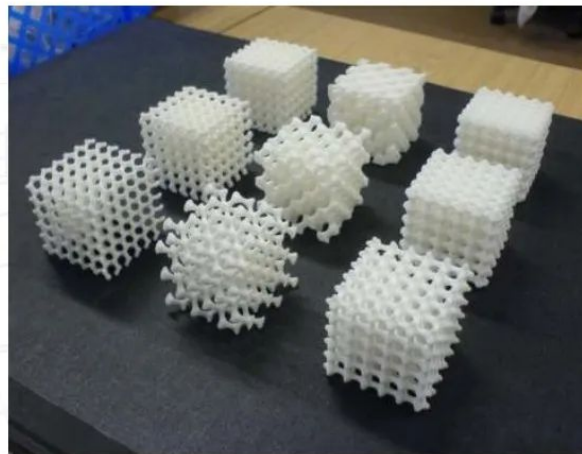
A Master's program in Mechanical Engineering offers a transformative experience wherein each student can reach his/her greatest potential and thus add to the enduring tradition of engineering innovation in Germany and other countries.

FUNCTIONALLY GRADED MATERIALS

HARIS THOMAS
Asst. Prof. MED

Functionally graded materials can be classified into two types, thin and bulk FGM.

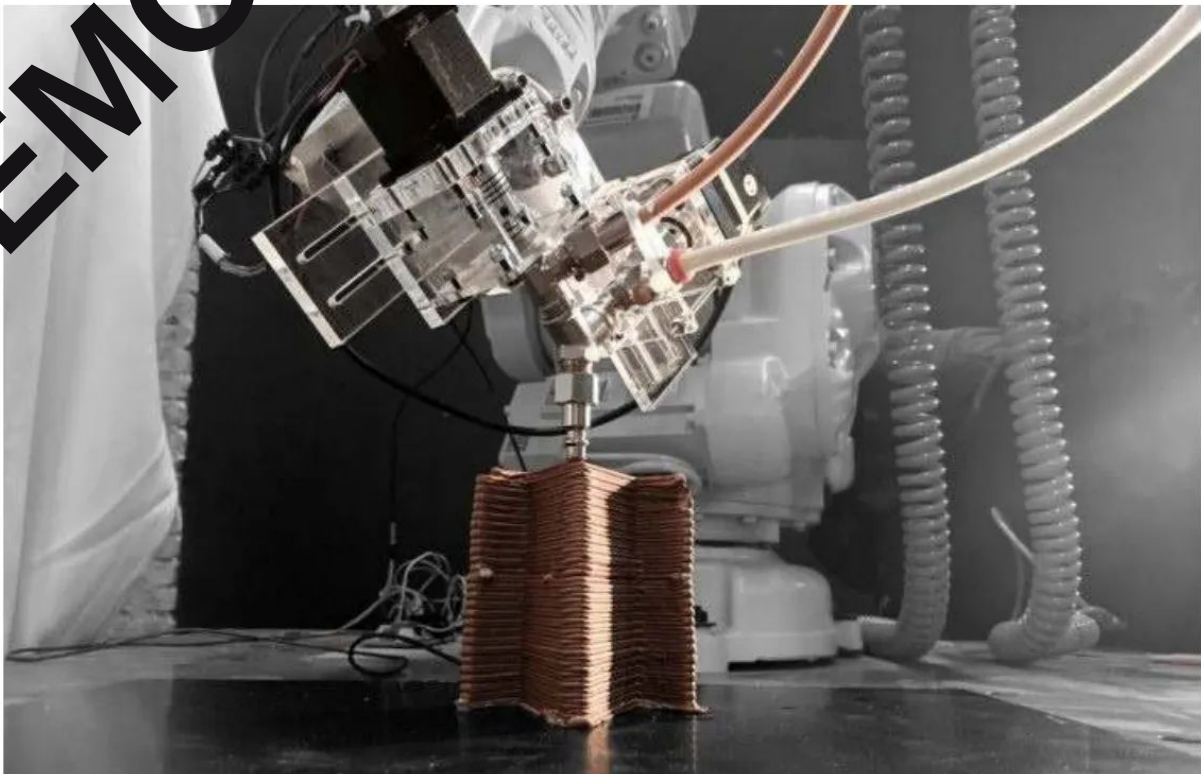
Thin FGM is a relatively thin surface coating, while the bulk FGM requires a thick layer of coatings. FGMs can be manufactured by many methods such as Powder Metallurgy, Centrifugal Casting method, Centrifugal Slurry method, Vapor Deposition, Infiltration, Plasma Spray Forming, Additive Manufacturing, etc. Among various fabrication methods, Centrifugal casting is the most straightforward and economical method to produce FGM with continuous gradient among all manufacturing techniques. From a fabricating point of view, either a horizontal or vertical centrifugal casting process can be utilized for manufacturing FGMs. Centrifugal castings acquire high mechanical strength and fine-grained microstructure.



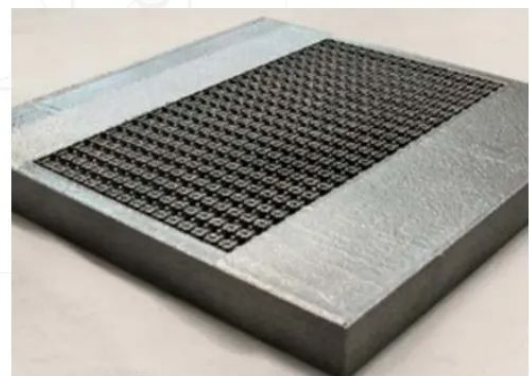
Also, the inclusions and impurities are lighter. Centrifugal casting is widely used for casting thin-wall cylinders. The Centrifugal Casting process uses the centripetal force to distribute the molten metal inside the mould. In centrifugal casting, there is a fixed mould which is rotating along the corresponding axis.

The melt will solidify after cooling. Due to its high temperature and invisible mould condition in centrifugal casting, makes it difficult to know the mechanism of molten material inside the mould. It is important to know the mechanism of the molten metal inside the mould, since it will help the manufacturer to know more accurately of the flow of the molten material so that it can

Also, the rotational speed and particle size determines the quality of the centrifugal cast component. Functionally Graded Metal Matrix Composites fabricated by centrifugal casting process are having good mechanical and other properties compared to matrix alloy.



work for improving the productivity and quality of the products. The fluid flow is an important factor in centrifugal casting process. With understanding of the fluid flow in centrifugal casting, it is possible to reduce the number of defects thus to improve the product quality.



ASWATHY P SAJEEV
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UNLOCK COMFORT & EFFICIENCY THE POWER OF ERGONOMICS

Ergonomics, derived from Greek words for "work" and "natural laws," is the science of designing environments, products, and systems for optimal human well-being and performance. In the automotive industry, ergonomics plays a crucial role in creating comfortable, safe, and intuitive vehicles.

Ergonomics in Action - Designing for Driver and Passenger Needs

From the layout of controls to the placement of seats, every aspect of a car's interior is meticulously crafted with ergonomics in mind. This ensures minimized fatigue and maximized convenience during long drives. HMI (Human-Machine Interface) refers to the touchscreens, buttons, and voice commands drivers interact with. Ergonomics in HMI design focuses on clear visuals and layouts to minimize distractions while driving.



DMU - Optimizing Ergonomics Before the Prototype

Digital Mock-Up (DMU) is a digital representation of a car's design. It allows engineers to analyze various components and simulate human interaction with the virtual interior. This virtual testing ensures optimal comfort and usability before physical prototypes are built.

Striking a Balance - Physical and Cognitive Ergonomics

Ergonomics addresses both physical and cognitive demands of driving. Physical ergonomics focuses on posture, movement, and biomechanics. It aims to minimize musculoskeletal disorders by designing ergonomic seats, steering wheels, and pedal placements.

Cognitive ergonomics, on the other hand, deals with mental processes like perception, attention, and decision-making. Its goal is to design intuitive interfaces that reduce cognitive load and enhance driver focus, ultimately improving safety on the road.

RULA and REBA - Tools for Posture Analysis

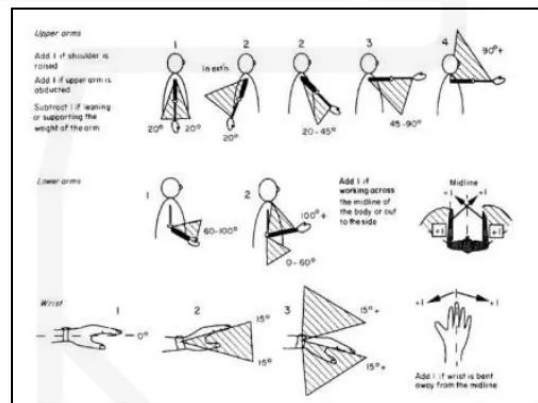
RULA (Rapid Upper Limb Assessment) and REBA (Rapid Entire Body Assessment) are ergonomic assessment tools used to evaluate the risk of musculoskeletal disorders associated with specific work tasks or postures. In the automotive industry, these tools help identify and mitigate ergonomic risks for assembly line workers and drivers by analyzing their posture and movements.

Software Solutions for Ergonomic Posture Analysis

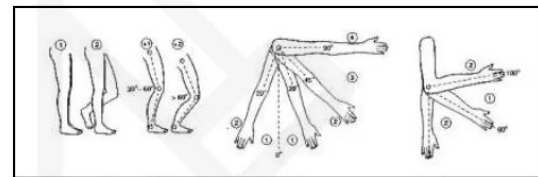
Various software solutions are available for ergonomic posture analysis in the automotive industry. These include 3D modelling and simulation software, motion capture systems, and virtual reality platforms. By integrating these tools into the design process, engineers can assess and optimize ergonomics early in the development cycle, reducing the need for costly design changes later on.

Conclusion: A Driving Experience Tailored to You

Ergonomics plays a pivotal role in the automotive industry, from designing comfortable and safe vehicles to optimizing human-machine interaction. By prioritizing both physical and cognitive ergonomics and leveraging advanced tools and technologies, manufacturers can create vehicles that not only meet regulatory standards but also exceed user expectations in terms of comfort, safety, and overall driving experience.



Samples of posture scoring in RULA method



Samples of posture scoring in REBA method

DMU(Digital Mock-Up)
of a vehicle engine compartment



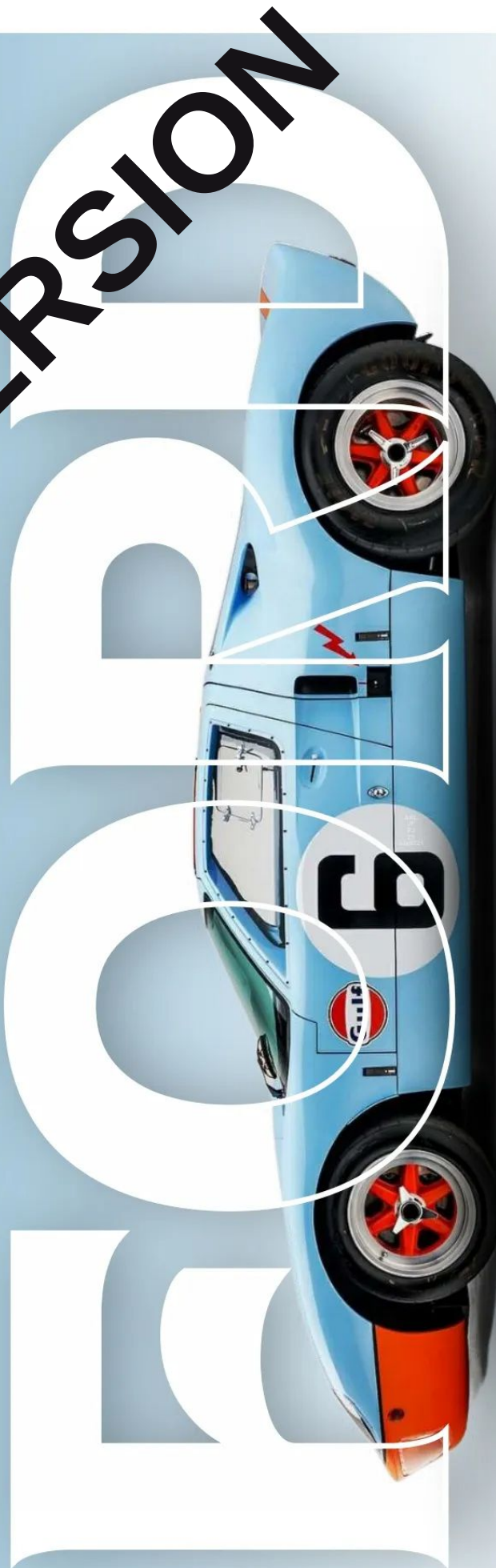
PMU(Physical Mock-Up)
of a vehicle engine compartment



A ROARING TALE OF
AMBITION, RIVALRY AND
REDEMPTION

Scorching heat cracks the asphalt. Engines ignite, a mechanical symphony reaching hell and beyond. Piston sounds, the earth tremble. This isn't a race, it's a war. Steel screams, rubber vaporizes. Ferrari, a sculpted predator, purrs with Italian precision. Ford, a roaring beast awakened, embodies American muscle. Le Mans awaits - a crucible of speed, ambition, and legend. The battle begins.

SARATH T S
ME 22-26



DEMO VERSION



FROM ACQUISITION TO ANNIHILATION

The story begins in the early 1960s, with Ford Motor Company yearning to revamp its image and enter the lucrative European sports car market. Their initial strategy? Acquisition. Lee Iacocca, a visionary executive, sets his sights on Ferrari, the undisputed champion of the 24 Hours of Le Mans, a grueling endurance race that tests both car and driver to the absolute limit. Imagine this: for 24 grueling hours, drivers push their machines through the night, battling fatigue, the ever-present threat of breakdowns, and the relentless pursuit of victory by their competitors.

However, negotiations with the passionate and fiercely independent Enzo Ferrari go awry. Ferrari uses Ford's offer as leverage to secure a better deal with Fiat, leaving Ford humiliated and hungry for revenge.

Building a Champion: Shelby and Miles Take the Wheel

Fueled by a bruised ego and a burning desire to topple Ferrari, Ford embarks on a daring mission - to build a car capable of conquering Le Mans. Enter Carroll Shelby, a former racing champion with a keen eye for talent, and Ken Miles, a brilliant but hot-tempered British driver with an engineering mind. Together, they form an unlikely but potent partnership. Shelby, with his experience and connections, oversees the development of the Ford GT40, a sleek and powerful machine designed to challenge Ferrari's dominance. Miles, with his raw talent and fearless spirit, pushes the car to its limits, testing both its capabilities and his own.

Facing the Challenge: Internal Politics and Engineering Hurdles

The road to Le Mans is far from smooth. Shelby and Miles face constant hurdles, not just from the formidable Ferrari team but also from within Ford itself. Corporate politics and conflicting priorities threaten to derail their progress. The GT40 suffers from reliability issues, pushing the team to the brink. However, Shelby



The starting lineup actually ended up favoring the cars starting further back in the event of a "dead heat" finish.

and Miles persevere, their dedication and ingenuity fueling their relentless pursuit of victory.

Le Mans: A Race of Grit, Strategy, and Controversy

Finally, the day arrives - the 24 Hours of Le Mans. The GT40, a testament to countless hours of grueling work, takes center stage. Miles, behind the wheel, unleashes the car's full potential, battling not only the Ferraris but also the elements and the ever-present threat of mechanical failure. The race becomes a war of attrition, testing the physical and mental endurance of both



Ford GT40 Mk II and the Ferrari 330 P3 Spyder

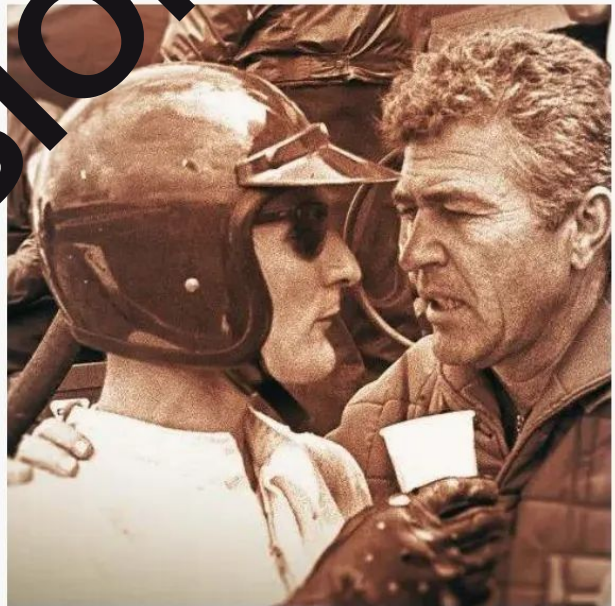


Ford GT40 Mk.II and Ferrari 250 GTO race track.

man and machine. Imagine the roar of the engines as they blur past, the pit stops executed with military precision, the tension building with every passing minute. However, victory is snatched away at the last minute. A controversial team order from Ford executives forces Miles to slow down and allow another Ford driver to take the checkered flag for a picture-perfect finish. The heartbreak is palpable, a bitter pill to swallow after a race so valiantly fought.

A Legacy Etched in Speed: Redemption and Loss

Though victory slipped through their grasp, the story of Ford vs. Ferrari is not one of defeat. It's a testament to the unwavering spirit of those who dared to challenge the status quo. Ken Miles, despite the injustice, shows remarkable sportsmanship. His talent and dedication are finally recognized years later with his induction into the Motorsports Hall of Fame. Tragedy strikes when Miles dies in a testing accident shortly after Le Mans, leaving a void in the racing world.



Ken Miles, left, talks with Carroll Shelby during the 24 Hours of Le Mans in 1966. Miles, in the eyes of many, had a win stolen from him that year.

Ford goes on to win Le Mans for the next three years, but the victory is forever tainted by Miles's loss. The film concludes with a touching tribute to his spirit, a reminder that ambition comes at a cost, and that true greatness lies not just in winning, but in the relentless pursuit of excellence and the unwavering pursuit of a dream.



Denny Hulme and teammate Ken Miles at the finish of the 1966 24 Hours of Le Mans where they finished second driving the Ford Mk1



Shiju Sasidharan
Founder and CEO,
BIMLABS Global.



Resource Scarcity in AECO Industry

The architecture, engineering, and construction (AECO) sector is a dynamic and multifaceted industry responsible for planning, designing, and managing infrastructure and buildings. It plays a crucial role in the global economy, contributing significantly to GDP and employment. Comprising various disciplines such as architecture, civil and structural engineering, mechanical and electrical engineering, plumbing, construction management, and specialized trade activities, the AECO industry has historically shaped the built environment and spurred economic growth.

AECO Industry Opportunities Overview

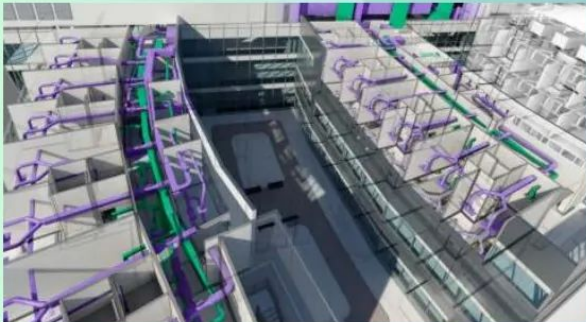
From the perspective of mechanical and electrical engineering, the evolution of BIM-enabled MEP design, documentation, fabrication, and asset management has transformed the entire planning, design, construction, and operation & maintenance processes of buildings and infrastructure development



projects. The benefits are not limited solely to the reduction of waste in terms of time, money, materials, labour, and equipment, but also extend to simplifying the complexity of the engineering and manufacturing processes. This advancement in the MEP sector has also saved significant time, effort, and money for other design departments, including architecture, structural engineering, interior design, and project management teams. The coordination process, which involves identifying clashes between various disciplines and elements, is key to saving contractors money and manpower.

Student Awareness Gap on Opportunities

The engineering curriculum, especially in mechanical and electrical streams, overlooks building and infrastructure development. Students have diverse specialization options like automobile engineering and product design, sidelining construction-related areas. Crucial subjects like HVAC and plumbing are neglected in favor of topics like refrigeration and thermodynamics. This oversight hampers students' understanding of opportunities in the Architecture, Engineering, Construction, and Operations (AECO) industries. Educators also lack awareness of these topics due to their minimal inclusion in the curriculum. Addressing this gap requires curriculum reforms to integrate comprehensive coverage of AECO-related subjects.



Technology and Processes of Mechanical and Electrical Engineers in AECO

Building Information Modeling (BIM) stands as a cornerstone for engineering professionals involved in various phases of construction projects. In the realm of mechanical engineering, BIM specialists play a pivotal role,

managing tasks ranging from heat load calculations to HVAC system design. They meticulously conduct clash detection, ensuring seamless integration of diverse components and systems. Moreover, their expertise extends to 4D/5D simulation, facilitating efficient construction management by predicting project timelines and costs accurately.



Mechanical BIM professionals are also responsible for creating highly detailed shop drawings, essential for the fabrication of MEP components. Furthermore, they diligently update as-built models, ensuring alignment with project progress and modifications.

Similarly, electrical BIM engineers oversee critical aspects such as lighting, power distribution, and Extra Low Voltage (ELV) systems throughout the project lifecycle. They handle clash detection to prevent conflicts between electrical components and other building elements. Additionally, they perform quantity take-offs and generate fabrication drawings to streamline the construction process.



Empowering

Next-Gen Professionals through

Cutting-Edge BIM Training & Services

BIMLABS Global isn't just a training provider; we're an ecosystem builder for the Architecture, Engineering, Construction, and Operations (AECO) industry. We equip aspiring professionals with the skills and knowledge needed to thrive in the age of Building Information Modeling (BIM).

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The meticulous updating and management of as-built models by both mechanical and electrical BIM specialists are essential for future asset management, operations, maintenance, and digital twin integration, meeting stringent project requirements and regulatory standards.

Essential AECO Skills and Career Progression

In today's academic setting, students often need to take the initiative to stay updated on industry trends and technologies. Social media platforms like LinkedIn serve as valuable resources, offering insights into innovations, case studies, and success stories from professionals worldwide. Additionally, many organizations host knowledge-sharing sessions, attracting industry experts and students alike.

To pursue a desired career, students can follow a simple formula: identify market trends, connect with relevant firms and roles, acquire necessary skills, and utilize academic activities like internships and industry visits to align with career goals.

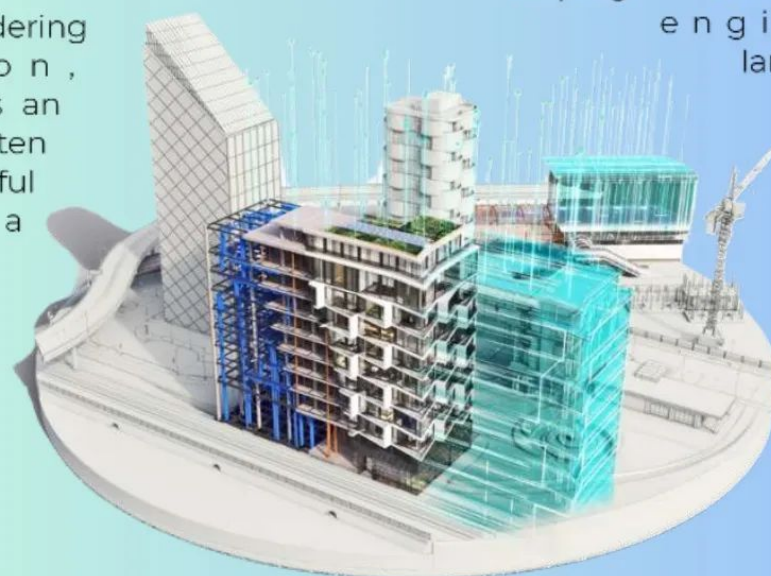
For those considering migration, transitioning as an employee is often more successful than as a student.

In the realm of Building Information Modeling (BIM), various roles have emerged, such as BIM Modelers, Engineers, Coordinators, and Managers. These roles offer lucrative opportunities for freshers, with responsibilities ranging from creating models to leading project coordination and management. As BIM and digital construction continue to evolve, standards like ISO 19650 play a crucial role in facilitating global knowledge exchange and advancing the construction industry.

The Future of AECO Industry Opportunities

Over the past two decades, the Middle East and Asia have been the focal points for mega infrastructure projects and events, driving the demand for core engineering professionals. Iconic projects such as the construction of the Burj Khalifa, Dubai Expo 2020, and the upcoming FIFA World Cup in Qatar in 2022 have showcased the region's capacity for ambitious undertakings. Currently, all eyes are on Saudi Arabia for its ambitious Vision 2030 plan and the FIFA World Cup in 2034, which are shaping the present

engineering landscape and are expected to do so for at least the next years.





AALWIN SUSSAN
ME 21-25

INDUSTRY 5.0

In the era of rapid technological advancements, industries are continuously evolving to enhance efficiency, productivity, and sustainability. From the introduction of Industry 4.0, characterized by automation and data exchange in manufacturing technologies, now we are currently approaching Industry 5.0, where human-centric approaches and collaboration between man and machine take center stage. This article explores the transformative journey from Industry 4.0 to Industry 5.0, highlighting their key

differences and implications for the future of manufacturing.

Industry 4.0: The Era of Automation and Digitalization

Industry 4.0, also known as the Fourth Industrial Revolution, revolutionized manufacturing by integrating cyber-physical systems, Internet of Things (IoT) and artificial intelligence (AI). Automation became the cornerstone, enabling seamless connectivity and real-time data exchange between machines and systems. Production processes became more efficient,

predictive maintenance became a reality, and customization at scale became achievable through advanced analytics and machine learning algorithms. However, despite its numerous benefits, Industry 4.0 also raised concerns about job displacement, as machines replaced manual labor in many tasks.

Industry 5.0: Era of Human-Machine Collaboration

Industry 5.0 represents a paradigm shift from the purely automated processes of Industry 4.0 to a model where humans and machines work collaboratively towards shared goals. Unlike its predecessor, which focused primarily on optimizing processes through automation, Industry 5.0 emphasizes the importance of human ingenuity, creativity, and problem-solving skills in manufacturing. It acknowledges that while machines excel at repetitive tasks and data processing, humans can innovate, adapt, and make decisions in complex and unpredictable situations.

Comparison Between Industry 4.0 and Industry 5.0:

Industry 4.0 and Industry 5.0 are two distinct approaches to manufacturing. Industry 4.0 is automation-driven, focusing on minimal human intervention, while

Industry 5.0 emphasizes human-machine collaboration. Industry 4.0 allows mass customization through data-driven insights and adaptive manufacturing technologies, while Industry 5.0 focuses on high-mix, low-volume production. Industry 4.0 relies heavily on algorithms and data analytics, often with limited human oversight. Industry 5.0 integrates human judgment and intuition into decision-making processes.

Implications for the Future:

Industry 5.0 heralds a future where technology complements rather than replaces human capabilities in manufacturing. By fostering a culture of innovation, creativity, and collaboration, it promises to drive sustainable growth, enhance product quality, and promote workforce development. However, realizing the full potential of Industry 5.0 requires a concerted effort from industry leaders, policymakers, and educators to nurture a skilled workforce capable of thriving in this human-machine ecosystem. As we transition towards Industry 5.0, embracing the synergy between humans and machines will be paramount in shaping a more resilient, adaptive, and inclusive manufacturing landscape.

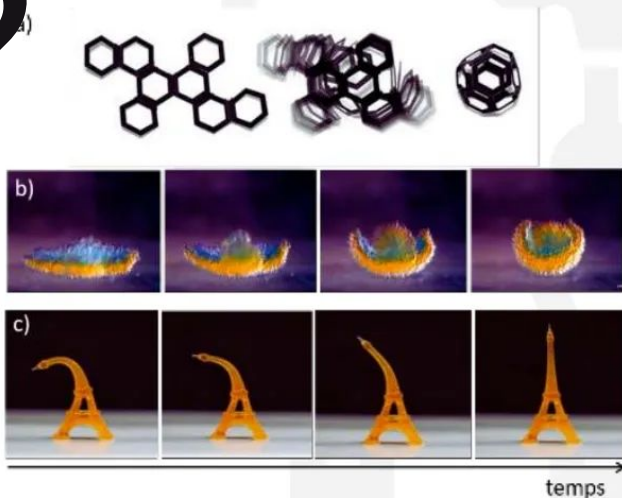


4D

MANUFACTURING

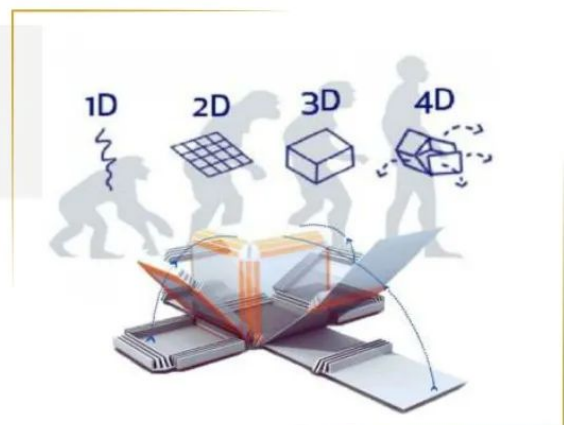
NEIL ALDRIN
ME 21-25

With the use of a developing technology called "4D" printing, solid components can be 3D printed with the potential to transform into different shapes in response to changes in temperature, light, and humidity. Transformation, then, is the literal meaning of the "fourth dimension." The creation and application of novel programmable materials are prerequisites for this capability. Despite being a relatively new field, it holds great promise for advancing engineering design.



At the moment, 4D printing needs laborious and intricate post-processing procedures to physically program every part. Furthermore, the majority of industrial printers are limited to printing in four dimensions (three dimensions) with just one type of material. However, scientists have recently developed a potent new 4D printer that can produce self-assembling 4D-structures much more quickly and effectively.

In 4D printing, a precise geometric code is added to the process based on the intended shape's dimensions and angles, whereas in 3D printing, layers of material are printed one after the other. It provides instructions on how to move or adapt in specific environmental settings as well as shape memory.

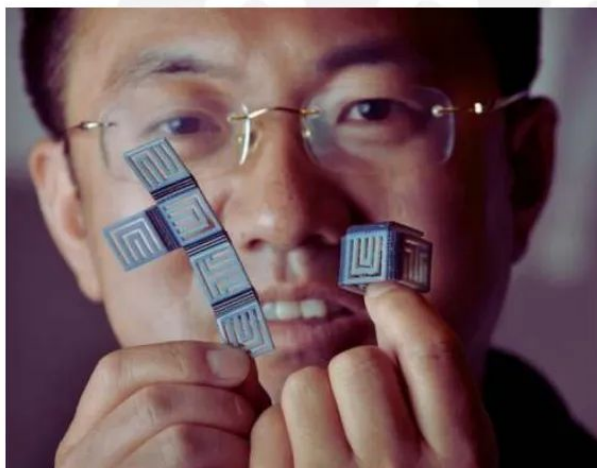


INTELLIGENT MATERIALS OF THE FUTURE?

Commercial 3D printers like the Polyjet 3D printer, are used in 4D printing technologies. A "smart material," such as a hydrogel or a shape-memory polymer, serves as the input. Unlike other 3D printing materials, smart materials are endowed with the ability to change shape. Currently, it is possible to learn more precisely about the structural and functional development of the human nervous system with the use of 4D printing technology in ultrasound scans. Three infants with respiratory issues were spared death in 2015 when a University of Michigan medical team used a 4D printed implant to save their lives. This polycaprolactone device was made to suit each patient precisely, to change size in response to the child's growth, and to dissolve on its own when it was no longer needed.



Using 4D printing technology, NASA has created an intelligent metallic fabric. This fabric's composition allows it to be utilized for astronaut suits, but it may also shield antennas and spacecraft against meteorite impacts. Clothes that conform to the contour and movement of the body can be made with the aid of 4D printing technology. The US military is experimenting with uniforms that can adjust their color to match the surroundings or control sweating in response to changes in temperature or soldier pulse. In the future, soft robots that can fit into and out of small spaces, implantable biomedical devices that can navigate blood vessels, and even organs for people in need of a lung, heart, or kidney could all be made possible by this new printing method. The future will be drastically changed by 4D printing, even if it is still in the research stage.



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HIGH

ENTROPY ALLOYS

High Entropy Alloys (HEA) are very much different from traditional alloys. Traditional alloys are an admixture of metals. metal combined with one or more elements is an Alloy. But, five or more primary elements that are equi-atomic or nearly equi-atomic in composition make up High Entropy Alloys. As the name implies, the high entropy effect in HEA can generate simple solution phases. High strength and hardness, ductility, good wear resistance, excellent corrosion resistance, and exceptional thermal stability are just a few of the



promising and exceptional thermal stability are just a few of the promising qualities that High Entropy Alloys exhibit. These characteristics result from four main effects:

cocktail effect, severe lattice distortion, sluggish diffusion, and high entropy of mixing.



To prepare HEAs, there are many different processing methods available. It includes vacuum induction melting, vacuum arc melting, melt spinning, rapid solidification, mechanical alloying, powder metallurgy and thin film deposition. Earlier, Melting and Casting were the most popular method for producing these alloys.

The main downsides of the casting technique are segregation and inhomogeneity in the microstructures. Due to the high fabrication costs and restrictions on the final shape and size of the goods, these fabrication approaches are also not the greatest choices for industries. High entropy alloys have been designed and synthesized using

Mechanical alloying to get over these restrictions and the resulting in component's solid solubility.

fabrication approaches are also not the greatest choices for industries. High entropy alloys have been designed and synthesised using Mechanical Alloying to get over these restrictions and the resulting in component's solid solubility. The fundamental benefit of mechanical alloying (MA) over other non-equilibrium processes is the production of more homogeneous, nanocrystalline and stable microstructures in the powder state, which can be further compacted into the appropriate form and shape.

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A Mechanical Engineer's Retrospective

JAIN JEJO ARAKKAL
ME 21-25

The Chernobyl nuclear disaster in 1986 highlighted failures in mechanical engineering, particularly the flawed design of the RBMK reactor and inadequate safety measures. It underscores the importance of rigorous safety protocols and meticulous design in engineering, emphasizing the need for engineers to prioritize safety, reliability, and efficiency in all projects to prevent future disasters.

The aftermath of the Chernobyl nuclear disaster serves as a stark reminder of the critical role that mechanical engineering plays in ensuring the safety and well-being of society. It brought to light the devastating consequences of

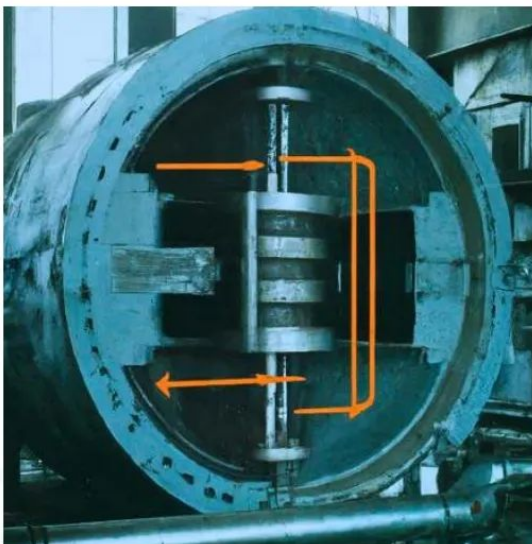
overlooking crucial safety measures and the significance of robust design in engineering projects. This catastrophic event emphasizes the imperative for engineers to place a high value on safety, reliability, and efficiency at all stages of project development. By learning from past mistakes and implementing stringent safety protocols, engineers can work towards a future where disasters like Chernobyl are prevented, and engineering advancements benefit humanity in a safe and sustainable manner.



A Flawed Design from the Start- The RBMK Reactor

The RBMK reactor, used at Chernobyl, had critical flaws from a mechanical perspective:

- **Graphite Mishap:** Instead of water, it used graphite to slow neutrons, which could accelerate them under pressure, risking a runaway reaction.
- **Flawed Control Rods:** Designed to absorb neutrons, their graphite tips caused a power surge before shutdown due to displacing more neutrons initially.
- **Delayed Failsafe:** The emergency shutdown relied on dropping control rods, but lengthy graphite tips caused a significant delay, proving disastrous.



RBMK (Reactor Bolshoi Moschnosti Kanalny - High Power Channel Reactor)

A Cascade of Mechanical Catastrophes

During a reactor test, operational limits were exceeded by withdrawing control rods and disabling the emergency shutdown system. When an emergency shutdown was attempted, design flaws caused a power surge instead. Flawed cooling system design led to a core temperature rise, resulting in a catastrophic power surge and ruptured coolant pipes. The exposed graphite core acted as a neutron accelerator, causing explosions that destroyed the reactor building and spread radioactive material.

The Human Cost of Mechanical Failure

The Chernobyl disaster remains the worst nuclear accident in history. The immediate death toll was 31, with thousands more succumbing to radiation sickness in the years that followed. The long-term health effects are still being studied, with estimates suggesting tens of thousands of additional deaths from radiation exposure. The environmental impact was equally devastating, with vast areas of land rendered uninhabitable for decades.



Aerial view of destroyed Chernobyl reactor after the accident in 1986 showing the extent of the damage caused.

Lessons Learned for the Drafting Board

The Chernobyl disaster serves as a chilling reminder of the importance of considering all potential failure modes during the design phase. For mechanical engineers, here are some key takeaways:

- **Prioritize inherent safety:** Design choices should prioritize safety features and minimize the potential for catastrophic failure.
- **Scrutinize Every Bolt and Gear:** Critical components and systems must undergo rigorous analysis and testing to identify and address potential weaknesses.

Fail-Safe, Not Fail-Maybe:
Whenever possible, designs

should incorporate fail-safe mechanisms to prevent accidents in case of malfunctions.

The Chernobyl disaster serves as a tragic lesson, forever etched in the minds of mechanical engineers worldwide. By understanding the role mechanical failures played in this catastrophe, we can strive to create safer and more reliable nuclear technologies for the future.

Looking Forward-Safety as the Cornerstone

significant advancements in nuclear reactor design post-Chernobyl prioritize safety with new materials and control systems. Mechanical engineers play a crucial role in ensuring safe nuclear technology use.



Construction of the plant and the nearby city of Pripyat, Ukraine to house workers and their families began in 1970, with reactor No. 1 commissioned in 1977.

We wonder are we alone in the universe? How does the universe work? The James Webb Space Telescope (JWST) is an ambitious scientific endeavour to answer these questions and to push the boundaries of human knowledge to understand the formation of the first galaxies and to understand how the universe works.

BEYOND HUBBLE : THE JAMES WEBB TELESCOPE

ANNA INASU CHUNGATH
ME 22-26



Who is Hubble? With over 1.5 million observations and 20,000+ papers published on its discoveries; Hubble is the most productive science mission in the history of NASA. Hubble, also known as Hubble Space Telescope was launched in 1990 on NASA's Space Shuttle Discovery, destination Low Earth Orbit. The JWST is the successor to the Hubble Space Telescope, and the two telescopes work together to explore the galaxies. The James Webb Space Telescope (JWST) and the Hubble Space Telescope are both reflecting telescopes that use curved mirrors to collect light.

The James Webb Space Telescope launched in December 2021 on Ariane 5 rocket, the launch vehicle belonging to the European Space Agency. This launch vehicle was selected because of its reliability and pay load delivering capacity of the rocket .The rocket had different stages that helped the payload to reach its desired mission area.



A new era in astronomy

The James Webb Space Telescope (JWST) reached its solar orbit near the Sun-Earth L2 Lagrange point, about 1.5 million km away on January 2022 and took about 29 days for the telescope to deploy various structures and beams, including the sunshield. This was a joint effort by NASA, ESA & CSA with a cost estimation of \$10 billion.

How did James Webb Space Telescope become a reality? Even before the Hubble Space Telescope's launch, astronomers began posing the question: What is the next step? In 1996, an 18-member committee led by astronomer Alan Dressler formally recommended that NASA develop a space telescope with infrared wavelength band that enables astronomers to see through dust and gas clouds. At first the telescope was named Next Generation Space Telescope which was later changed to James Webb Space Telescope, named after the NASA administrator who led the Apollo program, construction on Webb began in 2004 which was carried out by different company's. Webb's individual pieces, constructed in a variety



of locations, began to arrive at NASA's Goddard Space Flight Centre, in 2013. construction of the sunshield layers began. From 2013 to 2016, Webb's science instruments were subjected to numerous tests that module would endure in space and by early 2016, all 18 of Webb's individual mirrors were installed on the telescope. Additional environmental tests of the telescope and instrument assembly occurred in a giant thermal vacuum chamber at Johnson Space Centre in 2017.

Webb is the premier observatory of the next decade, serving thousands of astronomers worldwide. It studies every phase in the history of our Universe, to the formation of star systems capable of supporting life on planets like Earth, to the evolution of our own Solar System. Several innovative technologies have been developed for Webb. These include a primary mirror made of 18 separate segments that unfold and adjust to shape after launch. The mirrors are made of ultra-lightweight beryllium. Webb's biggest feature is a tennis court sized five-layer sunshield that attenuates heat from the Sun more than a million times. Webb's telescope's four instruments - cameras and spectrometers - have detectors that are able to record extremely faint signals. One instrument (NIRSpec) has programmable micro shutters, which enable observation up to 100 objects simultaneously. Webb also has a cryocooler for cooling the mid- infrared detectors of another instrument Mid Infrared Instrument (MIRI) to a very cold 7 K so they can work. The other two instruments are Near Infrared Camera & Fine Guidance Sensors/Near Infrared Imager and Slitless Spectrograph which help the JWST to collect more data and more precisely.

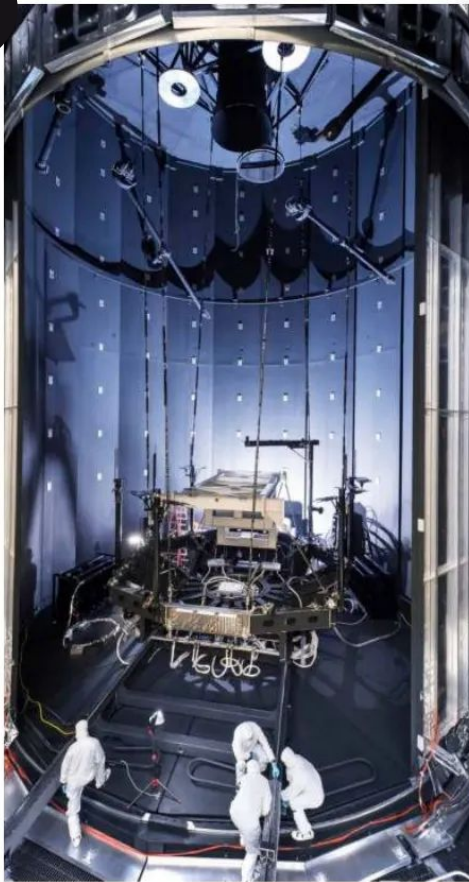


"SCIENCE
FOR
SOCIETY"

Currently the NASA's Goddard Space Flight Centre manages the James Webb Space Telescope project, while the Space Telescope Science Institute is responsible for mission and science operations, as well as ground station development, it is also to be noted that the public can use the James Webb Space Telescope if they have a pitch for telescope time that their peers approve. Most people apply for time through the General Observers program.

As of now the James Webb Space Telescope is designed to last at least 5.5 years, or six months of calibration, and up to 10 years, or 12 years of science operations. The JWST has given us more insight to the discovery that was found by the Hubble telescope because of its advanced technology and to note JWST has helped us understand the working of the universe and will go on to discover and explore the universe. Some of the pictures taken by JWST.

"JWST is a truly transformative instrument, and that's a word I don't use lightly" is a quote from Prof. Mike Gladders, who describes the James Webb Space Telescope as a "transformative instrument" as with this we can say the journey to explore the cosmos is just the beginning to understand the vastness out there as we know the hunt for answers will never stop that is what defines the human race and by the launch of JWST we are one step closer. The idea and design to build a new telescope with more advanced technology that help us to look more deeper than ever before has started and it is the NASA's Nancy Grace Roman Space Telescope.



UNVEILING THE NEXT FRONTIER-INTRODUCING THE LATEST INNOVATION IN MOBILITY

Introducing the Urbania by Force Motors. A vehicle so capable and versatile, it can transform to suit the needs of every type of customer, whether as a shuttle van for the senior management to commute, or as a tour van for the most elite vacationers. Treat your clientele to a truly world-class drive with best-in-segment standards of safety. The Urbania is designed, developed in India and refined by leading domain experts from Italy, Germany, Japan, Spain, UK and USA. It is benchmarked with the best offerings in the segment, and offers maximum space per passenger, best-in-class seating comfort, air conditioning, safety, and a host of thoughtful conveniences that make sure your customer's journey feels like a breeze, from start to finish. The Urbania by Force Motors is here to deliver a truly delightful travel experience for all your customers. The Urbania has car-like aerodynamics. Its body is designed in a way that there is a low drag, i.e. the backward pull force at the rear side of the vehicle. This results in excellent performance in terms of enhanced fuel economy, better acceleration and top speed, overtaking ability and stability with minimal roll.





DRIVER AND CO-DRIVER AIRBAGS AND COLLAPSIBLE STEERING
The Urbania features airbags for driver and co-driver, designed for occupant safety, and a collapsible steering column to prevent abdominal injuries to the driver.



ADVANCED ESP WITH ABS & EBD
Optional Electronic Stability Program (ESP) with ABS and EBD for skid-free emergency braking. Optional ESP enhances driving dynamics for improved control on slippery surfaces and sudden turns.



CAR-LIKE CRASH ROLL-OVER PROTECTION
Advanced high-strength steel reinforcement provides car-like frontal crash and roll-over protection.



BEST-IN-SEGMENT STAND-UP HEIGHT AND WIDTH
It has full stand-up height and wide aisles that allow passengers to move about without any discomfort.



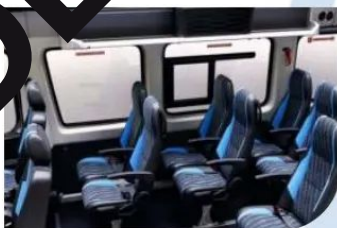
ADVANCED TRIPLE AC SYSTEM WITH INDIVIDUAL AC VENTS

The Urbania is equipped with a powerful triple AC system, with outlets on the dashboard, and through the individual passenger AC vents, where passengers can adjust the airflow. This ensures quick and uniform cooling across all seats.



RECLINING SEATS

The perfect torso angle, seat depth, and lumbar support provide ample support resulting in minimal strain on the passenger's thighs and back. Passengers can stretch their legs freely and enjoy a fatigue-free riding experience.



BEST-IN-SEGMENT CABIN SPACE, AND CAR-LIKE MINIMAL NVH IN PASSENGER COMPARTMENT

The vehicle offers ample legroom with the longest passenger compartment in its segment. Design features include a firewall to separate passengers from engine noise and dust, improving the travel experience.



INDIVIDUAL READING LAMPS AND USB PORTS

Passengers can read or work in the dark without disturbing other passengers. The individual charging points ensure that you can remain powered up while on the move.



SEALED PANORAMIC WINDOWS

Large, stuck glass, fully sealed windows offer panoramic visibility of the outside world while keeping out unwanted dust and sound.



FRONTAL CRASH COMPLIANT MONOCOQUE STRUCTURE

Urbania's high-strength steel improves vehicle stability, reduces body roll and pitch, and enhances safety against high-speed rear impacts.



AERODYNAMICALLY DESIGNED BODY

The Urbania's car-like aerodynamics with low drag enhances fuel economy, acceleration, top speed, overtaking ability, and stability.



CAMERA-BASED, ULTRASONIC SENSOR-BASED, REVERSE PARK ASSIST SYSTEM

Assists drivers by displaying the path and detecting obstacles during vehicle reversals using ultrasonic sensors that emit warning beeps.



FRONT BUMPER DESIGNED TO MINIMISE PEDESTRIAN INJURY

The Urbania meets pedestrian safety standards for M1 cars, providing minimal injury to pedestrians during accidents, although not required for larger M2 & M3 vehicles it belongs to.



HILL HOLD ASSIST WITH ESP

Premium cars have a feature that prevents rolling back on inclines by holding the vehicle when the driver shifts from the brake to the clutch pedal.

ORGANOID INTELLIGENCE

The world of artificial intelligence (AI) is evolving, but what if the constantly next big leap forward came not from ones and zeros, but from living cells? Organoid intelligence (OI) is a burgeoning field that explores the possibility of using lab-grown mini-brains, called organoids, for biological computing.

What are Organoids?

Organoids are 3D structures grown from stem cells that mimic the function and organization of certain organs, in this case, the brain. These tiny brain replicas hold immense potential for researchers. They can be used to study brain development, model neurological diseases, and even test potential drugs. Unlike traditional computers, organoid intelligence might achieve results through a more organic process similar to the human brain.

Imagine a computer that "learns" by forming new connections between its cells, rather than following a set of pre-defined rules. This could lead to a whole new way of problem-solving and potentially unlock entirely new functionalities for AI. The road ahead is مليئة بالتحديات (mulatan bit-tatadiyat, Arabic for "full of challenges"), but organoid intelligence represents a paradigm shift in our quest for artificial intelligence. It could redefine the boundaries between biology and technology, ushering in a new era of biocomputing.





MECH MECH MECH

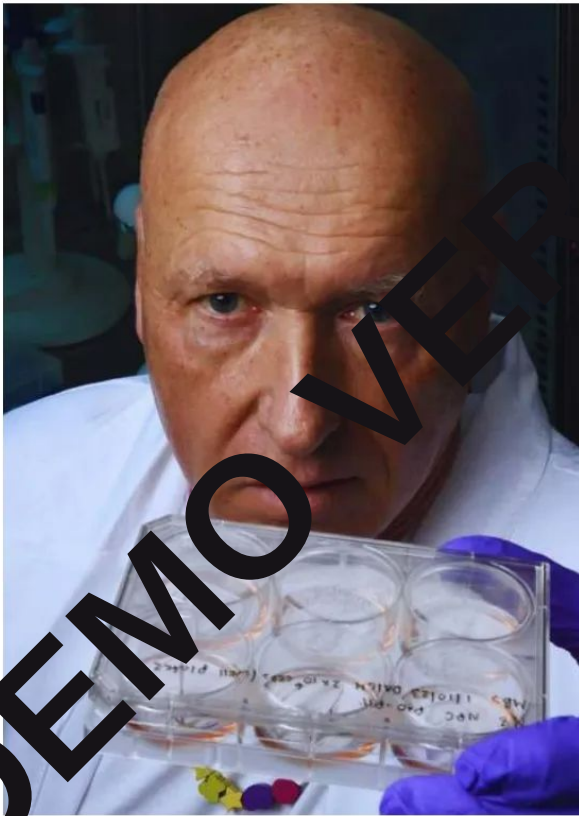
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MECH MECH MECH

PHOTO

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GALLERY



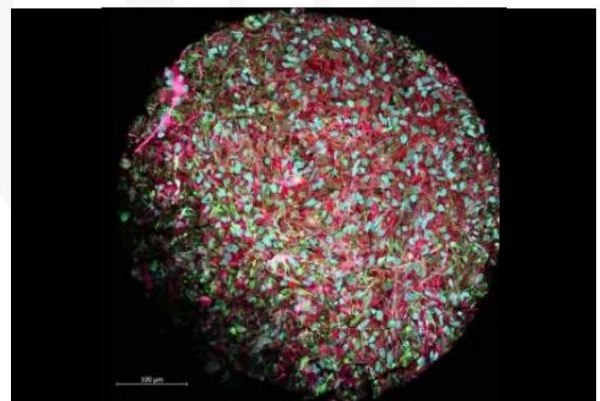
Thomas Hartung with brain organoids in his lab at the Johns Hopkins Bloomberg School of Public Health. Credit: Will Kirk/Johns Hopkins University

OI: A New Frontier in Biocomputing beckons with whispers of innovation. Here, the convergence of organoids and computational sorcery unfolds, envisioning a realm where the essence of life dances with the wonders of technology. This symbiosis heralds a Biocomputing renaissance, promising to reshape the landscape of artificial intelligence with its ethereal charms.

Cogitating akin to the mind's labyrinth, organoids, crafted from living brain cells, orchestrate a symphony of communication and cognition mirroring the enigmatic

workings of the human psyche. Within this realm, a tapestry of information processing unfurls, painting a portrait of efficiency and elegance far beyond the reach of traditional silicon sentinels. Amidst this arcane fusion, a revelation gleams like a distant star; the energy thrifty nature of the human brain, a paragon of efficiency, whispers secrets of power conservation to the realm of OI. Here lies the promise of matching computational prowess while sipping from the wellspring of energy sparingly.

Peering into the looking glass of organoid cognition, mystics of science seek to unravel the enigmas veiled within the corridors of the human mind. Through this communion of disciplines, the secrets of consciousness, learning, and memory shimmer on the horizon, promising a tapestry of enlightenment yet to be woven.



Magnified image of a brain organoid produced in Thomas Hartung's lab, dyed to show neurons in magenta, cell nuclei in blue, and other supporting cells in red and green. Credit: Jesse Plotkin/Johns Hopkins University



2020-24 BATCH



2021-25 BATCH

RPM

REAL PERSISTENT MEMBERS



ME FACULTY MEMBERS

DEMO VERSION



2022-26 BATCH



2023-27 BATCH



PRO SHOW - 43 MCES, ANNE AMIEV & DJ RICKY BROWN



SAE WEEK



BIG FIGHT SEASON 6



WORKSHOP BY DUKE



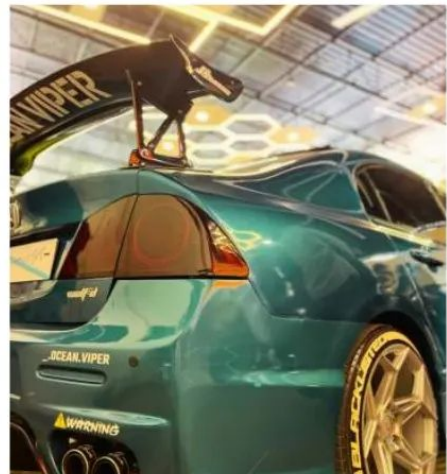
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MEXTALK



MAHINDRA EV WORKSHOP



MG EV WORKSHOP



AERION
DRONE
SHOW



CLUES AND CRANKS

REMAPOED AUTOSHOW



FROM B.TECH TO MBA @ TOP B SCHOOLS!



If you are anywhere close to completing your graduation, then MBA from one of the top B-schools in India would have definitely crossed your mind. So, let us cut the chase and come straight to the point.

We will talk about reason why you should do an MBA and reason why people tend to be afraid of preparing for an MBA!



MBA FOR GREATER JOB OPTIONS:

The array of job opportunities, the degree of responsibility, and the independence provided to MBA graduates in their positions justify the pursuit of an MBA. By specializing in

fields such as Marketing, Advertising, Finance, Strategy, and Consulting, the stakes and benefits are notably elevated.

MBA FOR FINANCIAL INDEPENDENCE:

We hear about the Rs. 1 crore plus salary packages that students from the IIMs get every year. Even beyond those, one can expect a package of 10-20 lakhs post an MBA from one of the top-25 B-schools in India. And mind you, these numbers are for a fresh out of B-school graduate. With a few years of work-experience the salary levels would only go higher. So, for even an average engineering graduate, MBA offers at least a 3 fold jump over his pre-MBA salary levels.

ENHANCED SOCIAL STATUS, NETWORKING, AND CREDIBILITY THROUGH AN MBA:

Entrepreneurs aspiring to establish successful ventures often require sector-specific expertise and financial support. Holding an MBA from a reputable business school significantly enhances the likelihood of securing funding for a startup. Furthermore, engaging with industry leaders facilitates valuable brainstorming sessions and insights, enriching one's professional network.

Myth



- Only students with exceptional academic background can Get into the top B-school process.
- You need to be super intelligent to clear CAT.
- The money needed to get into MBA is very high.
- If first get 3-4 years of experience and then prepare for MBA.

Reality



- Only a few B-schools have more than 10-15% weightage to past acads in the overall selection.
- Even an average student can manage 92-95% percentile score with proper planning and hard work and that means getting a call from one of the top-15 colleges.
- The government has extensive schemes for Education loans and your MBA dream can not be killed just for the want of money.
- Your salary post MBA would be a lot higher than before and if we are to look for a job in 3 years time, the work experience as an MBA would be more relevant and get you better jobs. Also, the weightage for work-ex is not very high (only up to 10-15%) and that too in very few B-school entrances.

B School Placements

All top management schools in the country have an exemplary track record of getting 100% placement with very good salaries and job roles. The B-Schools have also been quite successful in getting a number of their students placed in organizations that offer international postings. In fact, of late, the dollar salaries for these international placements range between USD 60,000 and USD 200,000 per annum. The IIMs and other 'Top-notch' institutes claim an average placement salary of about INR 25 to 35 lakh per annum! The highest salary on offer for domestic placements can be as high as INR 60 lakh per annum!! The lowest salary on offer at these management institutes is about INR 12-15 lakh.

SALARY LEVELS OF VARIOUS B SCHOOLS

B-School	T.I.M.E. categorization Grade	Program	Avg Salary (Lakh p.a.) 2020-22 batch
IIM Calcutta	Top 10	MBA	34
FMS Delhi	Top 10	MBA	32.4
XLRI Jamshedpur	Top 10	PGDBA/PGDHRM	30.7
SIBM Pune	AA	MBA	23.06
VGSOM (IIT Kharagpur)	AAA+	MBA	19.3
IIM Rohtak	A	MBA	16.06
IIM Visakhapatnam	AA	MBA	15.06
IIM Nagpur	A	MBA	15.21
GIM Calicut	A	PGDM	12.02
IIM Jammu	A	MBA	13.53
FORUM Delhi	A	PGDM	14.04

MAJOR NATIONAL LEVEL MBA ENTRANCE EXAMS

Exam Name	Exam Pattern	Comp based/PP	Additional Points
CAT.	Three sections VA/RC, DI/LR and QA with 24,20 and 22 questions respectively. Each section has a 40 mins time limit. Most questions are MCQs whereas few are Non Multiple choice questions, for which there will not be negative marking.	Computer Based	You do not need to apply separately to most of the IIMs. However, for any other institute using CAT scorecard, applications will need to be submitted separately.
XAT	The exam shall consist of the following sections: Quantitative Ability, Verbal & Logical Ability, Decision Making and General Awareness	Computer Based	The performance in General Awareness is not used for shortlisting of candidates for the GDPI round.
SNAP	60 Questions – 15 in General English , 20 in QA, DI/DS and 25 in Analytical and Logical Reasoning. Total duration-1 hour	Computer Based	Applicant needs to separately choose and apply to MBA programs of his/her choice. Rs 1000 is charged per program.Exam can be written max 3 times, best of 3 is considered.
CMAT	100 Questions – 20 each in QA & DI, LR, VA , GA and Innovation & Entrepreneurship	Computer Based	It is conducted once in the month of April/May.
NMAT	108 Questions in 120 Minutes, LS – 36 Q in 28 min; QS – 36 Q in 52 min; LR – 36 Q in 40 min	Computer Based	A candidate can write the test up to three times within the test window.

FOR MORE INFORMATION YOU MAY CALL US AT 0487-2440033 / 8086440033.

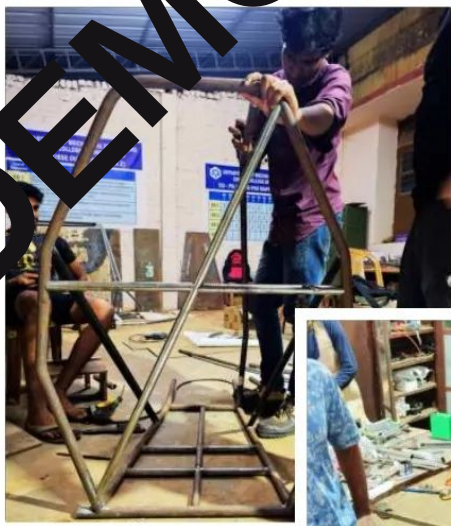


EBAJA '24

Our very own eBaja team, Prowler, comprised of dedicated students from the Mechanical and Electrical Departments, has roared into the top ranks of the eBaja 25 competition, securing an impressive All Kerala Rank 3!

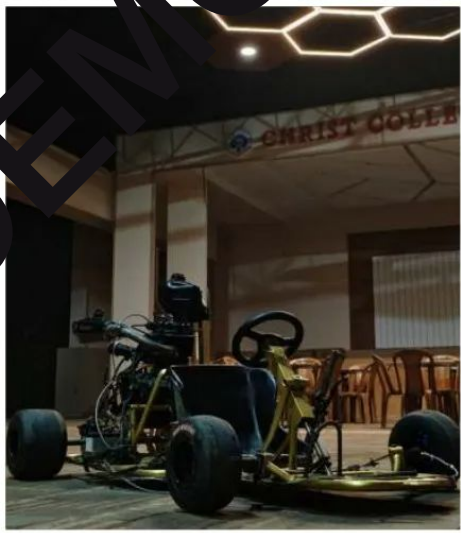
Prowler's success is a shining example of what teamwork and a relentless pursuit of learning can achieve.

This accomplishment not only brings immense pride to the Mechanical and Electrical departments but also serves as an inspiration to others, urging them to push boundaries and embrace the future of electric transportation.





Fueled by an unwavering passion for innovation and a thirst for knowledge, this dynamic team has been dominating the virtual race tracks, leaving a trail of excellence in their wake. Their commitment to electric mobility and sustainable engineering, coupled with their technical prowess, has propelled them to a well-deserved podium finish.



FKDC

Team Phoenix Racing, with students from S3 and S5 ME, secured 14th place nationally in the FKDC competition by FMAE. Mentored by Dr. Viswanath Kaimal, the team focused on performance and efficiency in vehicle design.

Each member contributed unique skills, working together to optimize the kart. Success was attributed to dedication, teamwork, and innovation. The achievement showcases technical skills and highlights the importance of collaboration and perseverance. The team is proud of their accomplishments and motivated for future challenges.

ELECTRIC SCOOTER DESIGN COMPETITION 2024



Move over gas guzzlers, Team ZEUS is here to electrify the streets! This dynamic group of students, a vibrant mix of talent from the Mechanical and Electrical departments, is making waves in the world of sustainable transportation. Their recent triumph at the SAE India Southern Section Electric Scooter Design Competition 2024 is a shining example of their dedication and ingenuity. Team ZEUS secured an impressive second place in the Best Endurance category, showcasing their meticulously designed electric scooter that prioritized both range and performance.

SAE NATIONAL LEVEL BICYCLE DESIGN COMPETITION



Team Carbon Composite from CCE at SAE National Level Bicycle Design Competition included members from S4 ME. The team was guided by Mr.Dony Dominic, Mr.Sanal , Mr.Joy E T, and Mr. Arjun.

CCE is among 60 premium institutes in Southern India and one of six from Kerala. The team completed all 10 rounds of the competition, including Technical Inspection round verified by SAE and ARAI officials and Automobile industry veterans.

From **B.Tech** to **MBA @ TOP B SCHOOLS**

41 Students join **IIMs/IITs** in **CAT22**



Akshay Krishnan KA
NIT SURATHKAL
IIM BANGALORE



Sucheth Jayan
NIT CALICUT
IIM BANGALORE



SHIVANI VS
MA COLLEGE, KOTHAMANGALAM
IIM BANGALORE



KABANI G
MA COLLEGE, KOTHAMANGALAM
IIM KOZHIKODE



GEORGE PHIL PUTHIVOTE
GEC THRISSUR
IIM KASHIPUR



KRISHNADAS D
GEC THRISSUR
NMIMS MUMBAI



KR AKSHAY
AMRITA COLLEGE
IIM AMRITSAR



JOHN JOSEPH
NIT COLLEGE OF ENGINEERING
TRICHY



ASWIN A
MA COLLEGE, KOTHAMANGALAM
IIM TRICHY



KIRAN BOSE
NSS ENGINEERING, PALAKKAD
IIM AMRITSAR



GOVIND PRASAD V K
GEC THRISSUR
IIM AMRITSAR



Yasir TA
GEC KOTTAYAM
IIT MADRAS



Aishwarya Padhu
GEC PALAKKAD
IIM AMRITSAR



ADITHYA SHAJI
NIT CALICUT
IIT ROORKEE



Sreehari Ramachandran
SREECHITRATHIRUNAL TVM
IIM BODHGAYA



ASHWIN S MUNDOL
MUTHOOT INSTITUTE, EKM
IIM SIRMAUR



Anjali RS
GEC THRISSUR
IIM BODHGAYA



JOHN J THARAYIL
GEC THRISSUR
IMT GHAZIABAD



MIDHUN KS
GEC PALAKKAD
IIT JODHPUR



AJAY KRISHNAN KB
GEC THRISSUR
IIT JODHPUR



Rithin A
CENTRAL UNIVERSITY
IIT JODHPUR



Amal Revi
SCMS
FORE DELHI



Shravan Krishna M
GEC WAYAND
FORE DELHI



Ashwin Ganeshan
LBS KASARGOD
FORE DELHI



Amal Jose Kollannoor
VIDHYA ENGG COLLEGE
TAPMI



AJAY JOHN
VIT VELLORE
TAPMI



Aravind Kishore
SKCET COIMBATORE
SIBM BANGALORE



ARSHAD ADIL PT
GEC THRISSUR
NIT TRICHY



ASWIN G NATH
JYOTHI ENGG. COLLEGE, THRISSUR
IMT NAGPUR



JERRY JAMES
JYOTHI ENGG. COLLEGE, THRISSUR
IMT HYDERABAD



Sreeyuktha R
HINDUSTAN COIMBATORE
IMT HYDERABAD



Aravind Menon
NSS ENGG, PALAKKAD
IMT HYDERABAD



ALEX DAVID
CHRIST COLLEGE OF ENGINEERING
XIME BANGALORE



SREERANJINI R
SIMAT VAVANOOR
SDM IMD MYSORE



Syama B
VIDHYA ENGG COLLEGE
ISME BANGALORE



Arya K Sunil
FISAT
SIBM HYDERABAD



MUSTHAFA JALAL
NSS ENGG PALAKKAD
IIT DHANBAD

New Batches for **CAT23/24**



T.I.M.E.

Triumphant Institute of
Management Education Pvt. Ltd.
THRISSUR



112 Students join Top 75 B Schools



8086 44 00 33

CAT | CMAT | BANK | SSC | GMAT® | GRE® | IELTS™ | CLAT | IPM | CUET

DEMO

ROYAL
MECH



**“PERFECTION IS ACHIEVED, NOT WHEN THERE IS
NOTHING MORE TO ADD, BUT WHEN THERE IS NOTHING
LEFT TO TAKE AWAY.”**



CHRIST
COLLEGE OF ENGINEERING
IRINJALAKUDA, THRISSUR, KERALA