ROHINI

COLLEGE OF ENGINEERING AND TECHNOLOGY

Approved by AICTE and affiliated to Anna University,(An ISO Certified Institution)

Department of Mechanical Engineering

CAMPUS COMMUNIQUE

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MECHTRON'23
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About Department

The Department of Mechanical Engineering started in the year 2012 with an initial intake of 60 students to the B.E Program and increased to an intake of 120 students from 2013 and 180 students from 2014. The Department offers ME Thermal Engineering programme from 2015 with an intake of 24 students. The Department is a recognized research centre by Anna University Chennai from the year 2019. The department accomplish outcome Based Education which help the students to learn, develop and serve to the society. The Departmenthas experienced and dedicated faculty with a wide range of specialization namely Thermal Engineering, Engineering Design, Manufacturing Engineering, Energy Engineering,CAD/CAM, Industrial Engineering and Mechatronics.

The faculty members have published more than 100 papers National/Internationaljournals/Conference and had written books, filed patterns during the last 3 years and receivedmany awards. The students were motivated by providing lot of opportunities like technical presentation in Symposium,conferences for skill development. The department provide value added knowledge to under graduates and post graduate students. Apart from curriculum students were motivated to participate in sports. The department has well established laboratory facilities to conduct research work on different specialized areas like Material Science, Renewable Energy, Thermal Science. The students of the department have received external research funding from Tamil Nadu State council for Science and technology in recent years.The students of the departments have joined in reputed industries through placements and some of them are turned to be an entrepreneur.The department has a good network of alumni.

Vision

To inculcate competence in the field of mechanical engineering for the students by providing quality education and learning opportunities to become ethically strong engineers for the development of society.

Mission

- To provide fundamentals and technical skills in Mechanical Engineering through effective teaching-learning methodologies.
- To provide an ambience for research through collaborations with industry and academia.
- To inculcate the students' leadership quality through employability skills with ethical

Programme Educational Objectives [PEO's]

PEO : 1

Graduates will apply the knowledge of Mechanical Engineering concepts and innovative methods to solve real world Engineering problems

PEO : 2

Graduates will have the required qualities for a successful carrier in Mechanical Engineering and related fields.

PEO : 3

Graduates will exhibit the professional skills with ethical values, Communication skills and team spirit.

Programme Specific Objectives [PSO's]

PSO : 1

Graduates of the program will achieve optimized design by utilizing their knowledge in thermalengineering, material science, manufacturing, fluid

PSO : 2

Graduates will be able to analyse and interpret by using modern tools and provide solutions toreal time mechanical engineering and related problems.

PSO : 3

Graduates will learn managerial skills to work effectively in a team and are aware of the impact of professional engineering solutions in human community, environmental context, ethics and be able to communicate effectively.

Chairman's Message

"Education isfor improving the lives of others and for leaving your community and world"

I deem it to be a matter of immense pleasure and honour for me to address you all through the website of ROHINI College of Engineering &Technology. It is indeed very heartening to witnessthat the college has carved a name for itself in the academicscenario of the region. Education is the mostpowerful tool to bring desirable changes in ourpersonality and also to bring positive changes in oursociety. It is the only medium which enables you to move from darkness to brightness.

Dear friends, I strongly believe that, there can be no better way to drive and improve our nation's prosperity and social economic well-being than through its education system. I also believe that, technocrats are the key to continued economic and technological advancement of our country.

I would take this opportunity to urge you all to focus on all round development. You should always have your education laced with morality and ethics. This task has to be taken over by the academicians to provide value and ethic based education. You should all remember that, "honesty is the first chapter in the book of wisdom" and we should inculcate honesty and integrity in all what we do.

I earnestly hope and trust that, my esteemed academicians and budding technocrats will work with sincerity, honesty and dedication and thereby contribute to make this world a better place to live in.

Best Wishes,
Shri.K.NEELA MARTHANDAN
Chairman
ROHINI Groups.

Principal's Message

'We make technocrats, who proudly say 'I am an Engineer; I serve mankind, by making dreams come true.'

The major challenge for today'sengineering educational institutions is to accommodate the evervarying aspirations of the younger generation because of increasingly changing demand and development in industries. We constantly put efforts to accommodate these aspirations by fine tuning the academics of college with innovative and practical oriented teaching learning practices along with other developmental activities.

Our goal is to change the world through education. It may sound idealistic, but this is precisely our long term goal. It is what motivates the work of everyone at the ROHINI College of Engineering and Technology from faculty and staff, to students and alumni. It inspires our teaching and research. It is this goal which fuels the faculty to excel

Our approach reflects the educational needs of the 21st century. We focus on our students by providing them with a world-class outcome based education and hands-on experience through research, training, and student forum activities etc. The success of our undergraduate,postgraduate & research programs is supervised by our eminent faculty, who continue to set the standard for excellence. There is continuous check on the implementation of planned academic activities with desired results in grooming our future generation for employment and for higher studies in India and abroad. A research culture has taken shape in the institute through enhanced R & D activities. We believe in continuous development and strive to carry on the best efforts and endeavours towardsthebenefitofstudents.

Our University results and placement speaks about our excellence with many of our students bringing laurel to the college by getting highest ranking in university exams and huge number of students are placed in national & multinational companies, moreover our students' creativity and determination is evident by this continuous success in various fields.
Our institute stands by its core values, mission of churning out well-rounded individuals and thorough professionals.

Best Wishes,
Dr.R.RAJESH, M.E., Ph.D.
Principal
Rohini College of Engineering &
Technology

HOD's Message

Mechanical engineering is one of the oldest and broadest engineering discipline, and plays a significant role in enhancing safety, economic vitality, enjoyment and overall quality of life throughout the world. Aprerequisite for development is growth and that is directly related to production or output of a country. A warm and Green Greetings from the Department of Mechanical Engineering at RCET.

A warm and Green Greetings from the Department of Mechanical Engineering at RCET. The college has been simply unstoppable in its progress asit has been actively involved in various activities that have brought to light the hidden talents of the college students and staff. Mechanical Engineering is a professional Core engineering discipline that deals with the design, production and maintenance of any produce of any industry.

Our department has a team of highly qualified and experienced faculty, good infra structure and lab facilities. We are striving hard continuously to improve upon the quality of education and to maintain its position of leadership in engineering and technology. We always work withthe motto "Nothing can be achieved without genuine effort." The core values of the departmenthelp the students to develop their overall personality and make them worthy to compete and work at global level. Our faculty are continuously attending various training programs,publishing research papers, books and filing patents. Many are pursuing research. Our department has been conducting seminar / conferences to keep the faculty and students abreast with the latest developments in the field of technical education. We are happy to share that many students are pursuing higher studies in leading universities in India and abroad. I am certain that our students will prove to be an invaluable asset to an organization. We,Mechanical engineers to build the nation

Best Wishes,

Dr. D PRINCE SAHAYASUDHERSON M.E, Ph.D

HOD of Mechanical Engineering,

RCET.

Editor's Message

It gives us great pleasure to bring you issue of MECHTRON 2023,the Mechanical department technical magazine of Rohini College of Engineering and Technology, Kanyakumari.

The objective of the magazine is to mainly focus on Achievementof the students from the Mechanical Engineering department in the Co-curricular and Extra-Curricular Activities.

The name and fame of an institute depends on the caliber and achievements of the students and teachers. The role of a teacher is to be a facilitator in nurturing the skills and talents ofstudents. This magazine is a platform to exhibit the literary skills and innovative ideas of teachers and students MECHTRON 2023 presents the skills and innovative thinking of students and contributions of teachers

We are also thankful to our Management and Principal for their support and encouragement..Last but not the least we are thankful to all the authors who have sent their articles. We truly hope that the pages that follow will make an interesting read.

Mr.G.Pradeesh
Editor of Department Magazine
ROHINI College of Engg. And
Technology.

About College

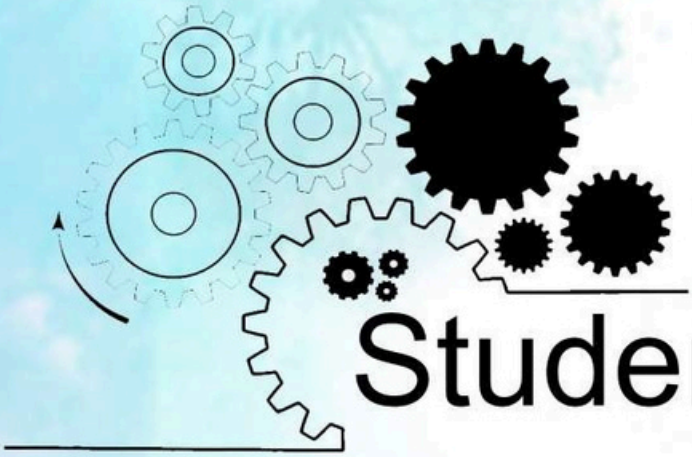
Rohini College Of Engineering And Technology

A temple of learning, is an ISO certified institution was founded by the great Industrialist and Philanthropist, Shri. K.Neela Marthandan. The main objective of our college is to advance the knowledge base of the engineering professions and to influence the future directions of engineering education and practice.

This is the best Engineering College in Nagercoil, Kanyakumari District.We believe not only in educating the students, but also in grooming characters, with moral and ethical values to build the nation. Since the beginning, the college has been providing world-class facilities & infrastructure in education and learning. The emphasisis on transformational leadership rather than directional leadership. We aim to establishnew trends, introduce innovative training methodologies, and thus guide students towards the road to success.

RCET VISION: To be an academic institute of continuous excellence towards education, research in rural regime, and provide service to nation in terms of nurturing potentially higher social, ethical and engineering companion graduands.

RCET MISSION: To faster and promote technically competent graduands by imparting the state of art engineering education in rural regime. To enunciate research assisted scientific learning by dissemination of knowledge towards science, agriculture, industry and national security.



Student's Articles

2.Gachaco battery swapping service launched by Japanese bike manufactures

Honda, Kawasaki, Suzuki and Yamaha are setting up a new company in Japan on 1 April with the energy company Eneos: Gachaco is to offer a sharing service for standardised exchangeable batteries of electric two wheelers and corresponding infrastructure. The Gachaco battery swapping system will use the Mobile Power Pack from Honda and plans to launch battery exchange stations for electric motorcycles and mopeds in Tokyo. Other major Japanese cities should follow from autumn 2022.

Eneos says it aims to contribute to the realisation of a recycling-oriented society by building a BaaS (Battery as a Service) Platform for electric mobility and other battery recycling systems. The battery swapping stations will be located in suitable places such as railway stations and Eneos filling stations. The plan is to reuse the batteries for secondary and tertiary use before they are finally recycled.

In second life applications for moped and motorcycle batteries, Gachaco will promote the use of standardised swappable batteries for other applications, such as stationary energy storage for commercial facilities and private homes. Second life applications for used EV batteries often also involve grid stabilising, as well as stationary storage for electric car charging stations.

CEO of the new company will be Kazunari Watanabe. Eneos has a 51 per cent stake in the company, Honda 34 per cent and Kawasaki, Suzuki and Yamaha five per cent each. Honda, Kawasaki, Suzuki and Yamaha already agreed on standards for swappable batteries and replacement systems as part of the Swappable Battery Consortium for Electric Motorcycles Motorcycles and Light Electric Vehicles, which was established in April 2019.

Yamaha is covering a few bases here since they have also joined Gogoro's battery swapping system in Taiwan. Here, Yamaha's electric scooters were designed utilizing Gogoro's Development Kit (GDK). Gogoro battery swapping stations look like they will outnumber petrol stations in Taiwan before the year is out. The Powered by Gogoro Network (PBGN) is open to customers with motorbikes and electric moped scooters from Yamaha Motor, Aeon Motor and Motive Power Industry and also includes India's Hero Motorcorp and China's Yadea and DCJ.

Battery swapping is heating up in Europe too. Earlier this month, Swobbee micromobility battery-swapping stations were financed for expansion in Europe, while the EU also published standards and guidelines for light electric vehicle batteries to enable battery-swapping.
storage

Anoop.F.S
IV-Mechanical A

3.Influence of inflow directions and setting angle of inlet guide vane on hydraulic performance of an axial-flow pump

Abstract

Inlet flow direction significantly affects the hydraulic performance of an axial-flow pump. Usually, the research papers ignore this phenomenon, resulting in discrepancies between simulation and experimental results. This study examines the influence of inflow direction in five cases (0%, 5%, 10%, 15%, and 30% pre-swirl intensities) to determine the relationship between the pre-swirl intensity and the hydraulic performance of the axial-flow pump. Based on this, changing the setting angle of the inlet guide vane (IGV) is proposed and thoroughly investigated to reduce the effect of inflow direction. In this study, the influence of clearances in IGV blades on hydraulic performance is also investigated in detail. Numerical simulations are performed using ANSYS–CFX and a shear stress transport reattachment modification (SST k-ω) turbulence model with small y+ values at all walls. Specifically, the hydraulic performance curves and internal flow characteristics, including contours and streamlines, are assessed and analyzed. The internal flow field and performance are not affected by the clearance at the hub and shroud of the IGV. However, the tip clearance of the impeller causes a decrease in hydraulic efficiency due to the tip leakage vortex. By adjusting the setting angle of the IGV, the efficiency and head gradually increase from a negative to a positive setting angle. Additionally, 30° is considered the critical setting angle for IGV

Introduction

Among the various types of pumps, the axial-flow pump can generate the largest flow rate with high efficiency and is widely applied in agriculture, irrigation, water supply, and drainage in factories, urban areas, etc. The internal flow field of an axial-flow pump is three-dimensional, complex, and unsteady because of the formation of many vortices, such as the tip leakage vortex (TLV)1,2,3,4,5, the horseshoe vortex5, secondary flow5, and trailing edge vortex5. In addition, there is a hydraulic loss due to cavitation6,7,8,9 and backward leakage flow through the impeller blade tip clearance5. They often cause vibration, noise, and impeller blade damage10,11.

Computational fluid dynamics (CFD) is an indispensable method for product research and development because of its usefulness, cost and time savings, and efficiency12,13. To record and analyze the phenomena occurring inside the pump, the most recent research utilizes CFD method and sometimes combines it with experimental tests. However, in most axial-flow pump studies using CFD method,

the inflow direction before entering the inlet guide vane (IGV) is straight14,15,16,17. In fact, this inflow direction is not straight; instead, it swirls around the rotational shaft of the pump because of the effect of the impeller18. Therefore, a difference between simulation results and experimental results is inevitable while doing the practical test19,20,21. Currently, there are no specific research articles stating the effect of inflow direction to verify this occurrence. Consequently, in this study, the change in inflow direction is thoroughly investigated to confirm their influence on the hydraulic performance of axial-flow pumps.

At design conditions, the axial-flow pump can stably operate for a long time with high performance and no phenomena. Notwithstanding, at low flow rate conditions, internal flow physics are unstable, and the stall phenomenon occurs, causing a sharp drop in hydraulic performance3,15,16,22. When the pump operates in the saddle zone, loud noises and severe vibrations are produced. In addition, it reduces the head and significantly impacts the safe and stable operation of the pump, as well as its long-term durability. To improve this phenomenon and efficiency at the off-design point, the setting angle of the impeller is adjusted by a rotating mechanism23,24. This strategy has contributed to a significant improvement in the hydraulic performance of the pump. However, to do this, the impeller structure of the pump must be highly complex and comprised of many components. In addition, because the impeller is a moving part, the impeller with a rotating mechanism is less sturdy than the integrally cast impeller24. In this study, changing the setting angle of the IGV to restrict the Korea Institute of Machinery and Materials, Korea. The test rig's system for the axial-flow pump is shown in Fig. 3. The experimental test was performed in a closed-loop test system with an impeller, and IGV chambers were made transparent to facilitate flow observation in the future with optimal models. The test system includes an electric motor, power meter, inlet pipeline system, outlet pipeline system, flow meter, outlet gate valve, water tank, pressure sensor, high-speed camera, fill light, and test pump. There are three pressure measuring devices, one mounted at the inlet and two at the outlet. Each pressure measuring device consists of four pressure hose pipes around the pipeline. In addition, two pressure hose pipes are located on the pipeline at the LE and trailing edge of the impeller to measure pressure fluctuations. The flow meter device is set far from the pump to receive a stable signal. To maintain the stable flow, the inlet and outlet of the axial-flow pump were extended away from the impeller to avoid interference with the backflow. A measuring system set behind the pipeline system is connected to the motor shaft to measure the shaft power. The phenomena occurring inside the pump are collected through a high-speed imaging system, including a fill light and a high-speed camera. The hydraulic performance data of the axial-flow pump at different flow rates was collected and processed through the data acquisition system.

Design and computational model Axial-flow pump model In this study, 3D numerical simulations are performed on the axial-flow pump with a specific speed of 1204 which is calculated by Eq. (14). The 3D geometry of the axial-flow pump evaluated in this study is shown in Fig. 4. The hydraulic components in the model consist of four stationary IGV blades, four rotating impeller blades, and seven stationary diffuser vane blades (DV). The tip clearance considered in the impeller blade is 0.0054 times the diameter of the impeller. The ratio of the impeller hub to shroud, which is defined as the impeller diameter ratio, is 0.2703. The model was scaled down eight times to the actual model. To prevent interference with the flow field inside the pump and observe fully developed turbulent flow, the inlet and outlet sections are extended to approximately four and five times the diameter of the impeller blade, respectively. The design flow rate coefficient (Eq. 15), head coefficient (Eq. 16), and rotational speed coefficient (Eq. 17) are 0.4319, 1.5841, and 0.7893, respectively, as shown in Table 2. Ideally, all passages should be modeled in the computational domain to examine the true internal flow field and to detect any asymmetry of the flow. However, most simulations of the flow field in the axial pump take advantage of the geometric symmetry, in this work, the computational domain is only constructed with one IGV passage, one impeller passage, and two DV passages with a pitch ratio of 1.00: 1.00: 1.14. To optimize the calculating accuracy and to cut down the profile scaling, this pitch ratio should be close to 1.032. As a result, two DV passages are modeled in the computational domain.

Results and discussion Effect of inflow direction The real flow in front of the IGV is actualized through the pre-swirl flow at the inlet of the axial-flow pump. Figure 9 presents the external characteristic curves obtained by the CFD method for different pre-swirl intensities ranging from 0 to 30%. The total head, flow rate, efficiency, and shaft power values are non-dimensionalized by using their values at BEP of the experimental result. As can be observed from Fig. 9, the pre-swirl flow significantly affects the hydraulic performance of the axial-flow pump, and their relationship is inversely proportional. In other words, as pre-swirl intensity increases, head, efficiency, and power decrease, especially at high flow rates and in the saddle zone15. For pumps, a reduction in shaft power is beneficial; however, in this study, not only the shaft power decreased but also the total head and efficiency, especially at 30%. Therefore, the high pre-swirl intensity is ineffective for an axial-flow pump, where efficiency and head are prioritized. Consequently, the theoretical analysisand numerical simulation results are similar. The poorer performance before and after the design point is due to the instability in the internal flow caused by low and high flow rates. At the BEP, the efficiency decreased by 4.263% between the 0% and 30% pre-swirl intensity, while the total head and shaft power decreased by 8.267% and 4.183%, respectively. These significant drops at high pre-swirl intensities indicate a significant loss at the IGV passage.

Conclusion

This study shows the influence of inflow direction on the hydraulic performance of an axial-flow pump and the preventive measures that can be taken. The impact of the inflow direction is divided into five cases, with pre-swirl intensity ranging from 0 to 30%. The hydraulic performance curves and the internal flow characteristics are compared to the experimental results. To avoid the effect of the pre-swirl flow, it is proposed that the setting angle of the IGV be altered. The clearance at the hub and shroud is created to easily alter the setting angle of the IGV. Meanwhile, five cases are being investigated to determine the impact of the setting angle for IGV. Based on the numerical results, the highlighted findings are summarized as follows:

1. The inflow direction significantly affects the hydraulic performance of an axial-flow pump. The inflow direction causes a difference between numerical and experimental results. The performance gradually decreases as the pre-swirl intensity increases because of the loss at the IGV passage. Based on the hydraulic performance curves and internal flow characteristics, the 5% pre-swirl intensity is consistent with the experimental results. The mechanism of formation and evolution of the TLV is revealed with the combination of tip leakage flow and flow separation.

2.The influence of the clearance at the hub and shroud of the IGV on the hydraulic efficiency of the axial-flow pump is negligible. Due to the tip leakage flow, the tip clearance at the impeller significantly impacts the internal flow physics and performance of the axial-flow pump.

3. Adjusting the setting angle of the IGV alters the internal flow field and performance of the axial-flow pump. The hydraulic efficiency gradually increases as the setting angle transitions from negative to positive. However, this loss is negligible when compared to the energy gained by the impeller.The increase in setting angle decreases the absolute flow angle at the LE of the impeller, enhancing the hydraulic performance of the impeller part. Nevertheless, the saddle zone becomes evident with positive setting angles. The critical point of the setting angle for the IGV is 30°

Akshayjith.S.R
IV-Mechanical A

4.Generalized Oscillations in Mechanical Engineering

In undirected networks of linked harmonic oscillators with communication delays and local instantaneous interaction, a distributed synchronisation mechanism is used. Analytically, certain generic exponential convergence requirements for such an algorithm over undirected fixed and switching network topologies are defined. Unlike current pure continuous or discretetime techniques, our work solves the synchronisation problem in undirected networks even if each oscillator only trades velocity information with its neighbours at select discrete moments.

A classical oscillator's energy fluctuates continuously. The lowest possible energy for a classical oscillator is 0, which corresponds to an object at rest in its equilibrium position. A classical oscillator in its zero-energy state has no oscillations and no motion a classical particle at the bottom of the potential well in. When an object oscillates, it spends the majority of its time near the turning points, regardless of how large or tiny its energy is. Periodic motion isn exemplified by the harmonic oscillator. The atoms in a crystal are temporarily displaced from their regular positions in the structure due to the effects of the temperature .

Thermal energy absorption As a result, inter-atmoc forces obeying Hooke's Law act on the atmosphere. artoms displaced Each atom vibrates about its normal under the influence of such restorative forces location, which is the ideal structure's right position. As a result, each atom's vibrations are those of a basic harmonic oscillator are comparable. The spring's restoring force is plainly electromagnetic. The rules of electromagnetism (Maxwell's laws) and the Lorentz force law would have to be utilised to establish the spring's restoring force in order to obtain a fundamental model. No one knows how to construct a model like this. Instead, a constitutive law, which is designed to be a good approximation of reality, could be used to represent the force. Hooke's law is the most common force law: the restoring force is proportionate to the displacement and directed toward the mass's equilibrium position.

Although we begin with a mechanical example such as a weight on a spring, a pendulum with a small swing, or other mechanical devices, we are actually studying a differential equation. This equation appears frequently in physics and other sciences, and it is a component of so many events that it is well worth our time to investigate further. The oscillations of a mass on a spring, the oscillations of charge flowing back and forth in an electrical.the vibrations of a tuning fork that generates sound waves, and the comparable vibrations of the human body are all examples of phenomena involving this equation .

The probability density of the ground state is concentrated at the origin,implying that the particle spends most of its time at the bottom of the potential well, as one would anticipate for a low-energy state. The probability density peaks at the classical "turning points," where the state's energy corresponds with the potential energy, as the energy increases.

This is compatible with the classical harmonic oscillator, in which the particle spends more time (andn hence is more likely to be found) near the slowest turning points. As a result, the correspondence principle is satisfied. Furthermore, coherent states, which are nondispersive wave packets with low uncertainty, oscillate similarly to classical objects

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Ajai Manoji K R
IV Mechanical A

5.TIME MANAGMENT

Time management is the process of organizing and planning how to divide your time between different activities. Get it right, and you'll end up working smarter, not harder to get more done in less time even when time is tight and pressures are high

The highest achievers manage their time exceptionally well. And by using Mind Tools' time-management resources, you too can make the most of your time starting right now!

The Benefits of Good Time Management

When you know how to manage your time effectively, you can unlock many benefits. These include:

- Greater productivity and efficiency.
- Less stress.
- A better professional reputation.
- Increased chances of advancement.
- More opportunities to achieve your life and career goals.

Overall, you start feeling more in control, with the confidence to cho ose how best to use your time.

General Time-Management Tools

Mind Tools has a range of resources designed to improve your time management overall. These offer practical solutions to common time management challenges, as well as ways to change key habits for the better.

Smile Pon Singh
IV Meahanical C

6. Geothermal

The Upgraded Geothermal Frameworks (EGS) incorporate a bunch of procedures that plan to build the porousness of the dirt through the water powered feeling of the organization of rock mass breaks and, thusly, diminish the strain drop of the stream and work on the proficiency and seriousness of this asset. Water powered feeling includes two potential methodologies: water powered breaking, compelling the opening and making of new cracks and hydro-shearing, which tries to reactivate and slide the prior cracks. In the two cases, water is infused at high tension in underground arrangements, which diminishes frictional strength along shortcomings and in the end reactivates them. A few instances of incited seismicity related with EGS are the undertakings of Rosemanowes (UK) , Basel (Switzerland), Cooper Bowl (Australia) and Pohang (South Korea) . All things being equal, there are aggressive EGS extends as of late sent off in the US, notwithstanding customary geothermal double-dealings that are being created or extended, for example, the Larderello plant in Italy or the Fountains project in the US .
Going against the norm, its safeguards contend that the problematic capability of geothermal energy in energy maintainability is adequately significant to acknowledge the dangers, concentrating on its conceivable alleviation. To settle on conclusions about these advancements, it is important to discuss in view of logical information, which is presently at a beginning phase .

The association between grating peculiarities and poro elastic processes nearby blames is, subsequently, a region to investigate. In this work, we present a computational structure in light of the utilization of a totally implied limited component model that tackles the conditions of the completely coupled thermo-hydro-geo mechanical and frictional peculiarities.

Conclusion

In the long run, we notice that it takes a long time to see visible warm changes in the repository. These developments may result in a heated decomposition of the repository, which will be heavily dependent on the permeability of the fractures in the host rock and the improvement accomplished with water propelled feeling. Our model can be a useful tool for achieving a balance between water-powered excitement, induced seismicity, and energy generation in geothermal supplies. Our findings will contribute to the evaluation of activity conventions, limit seismic threats, and may assist specialists and partners in making decisions about this troublesome innovation and reducing social opposition to EGS projects.

Bobin Yose
IV Mechanical

7.INDUSTRY 4.0

Introduction.

Industry 4.0 is revolutionizing the way companies manufacture, improve and distribute their products. Manufacturers are integrating new technologies, including Internet of Things (IoT), cloud computing and analytics, and AI and machine learning into their production facilities and throughout their operations.

Building Blocks of Industry 4.0

Internet of things (IOT)

The Internet of Things (IoT) is a key component of smart factories. Machines on the factory floor are equipped with sensors that feature an IP address that allows the machines to connect with other web enabled devices. This mechanization and connectivity make it possible for large amounts of valuable data to be collected, analyzed and exchanged.

Cloud computing

Cloud computing is a cornerstone of any Industry 4.0 strategy. Full realization of smart manufacturing demands connectivity and integration ofengineering, supply chain, production, sales and distribution, and service. Cloud helps make that possible. In addition, the typically large amount of data being stored and analyzed can be processed more efficiently and cost-effectively with cloud. Cloud computing can also reduce startup costs for small and medium-sized manufacturers who can right-size their needs and scale as their business grows.

Digital twin

The digital transformation offered by Industry 4.0 has allowed manufacturers to create digital twins that are virtual replicas of processes, production lines, factories and supply chains. A digital twin is created by pulling data from IoT sensors, devices, PLCs and other objects connected to the internet. Manufacturers can use digital twins to help increase productivity, improve workflows and design new products. By simulating a production process, for example, manufacturers can test changes to the process to find ways to minimize downtime or improve capacity.

Nadar Satheesh Thangapaul
IV Mechanical C

8.UNDERWATER TURBINE

There are a lot of renewable energy resources sources which are used to obtain energy such as the solar energy obtained by placing solar panels, wind energy obtained by placing windmills on fields so that by wind energy it will give rise to rotation of blades and producing electricity further.

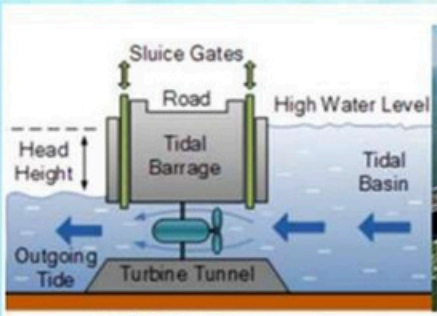
Similarly this new technique has been coming into practice to the coastal areas where the turbine blades which are used for the wind energy purpose are placed underwater near the coastal areas. Because the coastal area receives the high and low tides due to the gravitational effect by sun and moon and the rotation of earth.

Ocean currents have the tendency to produce more currents as oceans are more dense than air (they are 832 times more dense than air),due to which it applies greater force on turbines.

Tidal energy can be produced by many technologies, the major ones are:

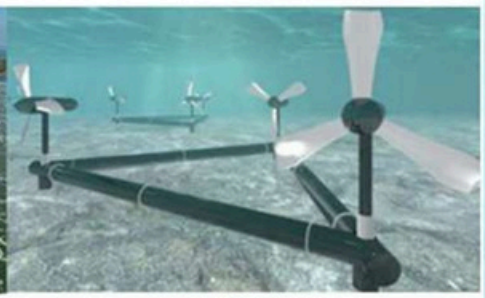
1) Tidal barrages
2) Tidal fences
3) Tidal turbines.

Hence tidal has one very distinct benefit it is virtually 100 predictable as unlike windmills which are criticized for spoiling the views on land. With underwater turbines you cannot hear it or see it and hence they are very environmentally beloved and does not produce any noise.



Tidal Barrages


Tidal fances


Underwater Turbines

Robin Raja . R
III Mechanical C

Students Project

Manufacturing of Affordable Electric vehicle for Physically challenged people with Reverse motion

students Ashik S, Dhanush V and Jenish T were presented a project on Manufacturing of Affordable Electric vehicle for Physically challenged people with Reverse motion. As the demand for accessible transportation solutions grows, there is a pressing need to design and manufacture electric vehicles (EVs) that cater specifically to physically challenged individuals. This project aims to create an affordable electric vehicle equipped with reverse motion capability, ensuring independence and mobility for users

Modified vehicle with LPG PROJECT

Modified vehicle with LPG project was presented by the final year students JINO P JACOB ,BOBIN S, SANDHRU AND ALLAN BABU By modifying vehicles to run on LPG, we can create a sustainable and accessible transportation solution for physically challenged individuals. This project aims to empower users through enhanced mobility while promoting environmental responsibility. Through innovative design, strategic partnerships, and a commitment to affordability, we can make a significant impact in the accessible vehicle market.

Fabrication of Automatic Seed Blower using ARUDINO

Jehan hassan B, Krishna Sundaram M V and Pradeep Kumar S of final year students made a project on agricultural sector continuously seeks innovative solutions to improve efficiency and reduce labor costs. This project proposes the design and fabrication of an Automatic Seed Blower powered by Arduino technology. This device will automate the seed planting process, ensuring uniform seed distribution while minimizing waste and maximizing productivity

Fabrication of Material Handling Through Belt Drive

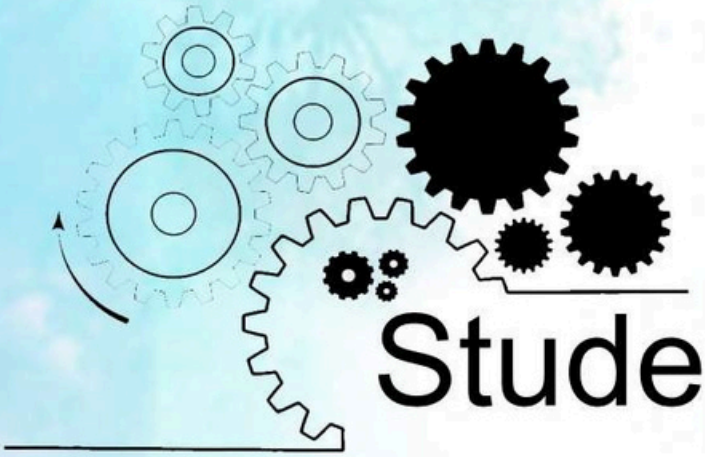
Abishek A, Akashj M, Kabil Dev S and Hariharan R were made a project on Fabrication of Material Handling Through Belt Drive Efficient material handling is crucial in various industries, including manufacturing, warehousing, and logistics. This project proposes the design and fabrication of a material handling system utilizing a belt drive mechanism. The system aims to improve the efficiency of transporting materials within facilities while minimizing manual labor.

Fabrication of Button Operated Gear Shifting Mechanism

Fabrication of Button Operated Gear Shifting Mechanism was made by Anoop F S , Govinda Rajan G and Inba Surya Prakash of final year students .The automotive industry is evolving with a focus on enhancing user experience and convenience. This project proposes the design and fabrication of a button-operated gear shifting mechanism, aimed at simplifying gear changes in vehicles. This innovative approach can improve driving comfort and accessibility, especially for individuals with mobility challenges.

Fabrication of 360° wheel mechanism

Fabrication of 360° wheel mechanism project presented by vignesh A, Vineesh Kumar and Ajith G. The demand for innovative mobility solutions is increasing across various industries, including robotics, automotive, and material handling. This project proposes the design and fabrication of a 360-degree wheel mechanism, which allows for omnidirectional movement. This technology enhances maneuverability and flexibility, making it ideal for applications such as robotic platforms, automated guided vehicles (AGVs), and more.



Student's Composition

Composition

1.Science

Everything works,
Because of science.
Even your old
Kitchen Appliance.
what about your
mom car?
Without science
It wouldn't go far.
With science we could move
A computer or phone,
If you want a twin,
Just ask for a clone,
Science will explain,
nature and trees,
It's also used,
to find cures for disease,
Science is cool,
the evidance is clear,
It's so much fun,
enjoy it my dear

Smile Pon Singh
IV Mechanical C

2.தன்னம்பிக்கை

தன்னம்பிக்கையை இழந்து விடாதிர்கள்
இன்றைய தினம் கடினமாக இருக்கலாம்
நாளை மிக மோசமான தினமாக இருக்கலாம்
ஆனால், நாளைய மறுதினம் நிச்சயம்
பிரகாசமாக இருக்கும்.

Prabu TN
IV Mechanical C

3.Mechanical Poem

In the world of machines and gears,
Where engineering truly steers,
There lies a craft that's truly grand,
A field of study that's in high demand.

Mechanical engineering is the art,
Of designing and building right from the start,
The machines that power our daily life,
And make the world free from strife.

From automobiles to airplanes,
Mechanical engineering sustains,
The world we know and love so well,
With innovation that never fell.

The principles of physics, math, and more,
Are used to build what we adore,
The structures and devices that surround,
And make our lives much more profound.

So hats off to the mechanical engineers,
Who work so hard and without fear,
To make our world a better place,
And leave a lasting engineering trace.

G. Navin
IV Mechanical C

4.Mech Joke Q/A

Why did the mechanical engineer get a divorce?

He didn't understand his wife's fluid dynamics.

Why did the mechanical engineer go broke?

He spent all his money on bearings.

How many mechanical engineers does it take to change a light bulb?

None, they just design a machine to do it.

Why did the mechanical engineer cross the road?

To get to the other side's stress analysis lab.

Why was the mechanical engineer so bad at telling jokes?

He kept getting his punchlines caught in the frictional forces.

S. Venkadesh

IV Mechanical C

5. Mechanical Engineering

Why did the mechanical engineer quit his job?
He didn't get a raise, but his screws sure did.

How do mechanical engineers party?
They turn up the torque and rev their engines.

Why did the mechanical engineer cross the road?
To get to the other side, of course, but he also wanted to analyze the friction coefficient of the pavement.

How many mechanical engineers does it take to change a light bulb?
None, they just design a machine to do it for them.

Why do mechanical engineers always use metric units?
Because it's easier to convert when you're working on a global scale.

Why did the mechanical engineer refuse to go on a blind date?
He heard she was a "wrench" and he didn't want to get "screwed."

What's a mechanical engineer's favorite movie genre?
Action films, because they always have lots of moving parts.

How do you know if a mechanical engineer is an extrovert?
He looks at your shoes when he talks to you instead of his own.

Why don't mechanical engineers tell jokes?
They don't want to get caught in a "gear" of laughter.

What do you call a group of mechanical engineers?
A bunch of nuts and bolts.

Navin.G
IV Mechanical C

6. Mechanical Engineering

Why did the mechanical engineer cross the road?
To get to the other side!

Why don't mechanical engineers tell jokes?
They take everything too literally.

Why was the mechanical engineer unhappy with his job?
He couldn't find a gear he liked.

Why did the mechanical engineer build a robot out of toilet paper?
Because he wanted it to be able to tear itself apart.

Why did the mechanical engineer refuse to buy a car with a push-button transmission?
He didn't want to drive anything that was "out of touch".

What do you call a group of mechanical engineers?
A "force" to be reckoned with.

Why did the mechanical engineer go to the doctor?
He had a piston in his chest and needed a valve replacement.

How many mechanical engineers does it take to change a light bulb?
None, they just redesign the fixture to make it more efficient.

What did the mechanical engineer say when he discovered the laws of thermodynamics?
"I can't believe I didn't think of that!"

Why did the mechanical engineer wear a hard hat to bed?
In case he had a nightmare about a falling crane.

Vignesh.A
IV Mechanical C

7. Mechanical Poem

Gears that create thoughts,
Talents that make changes,
States that only function for enough,
The emotions that look forward,

Electricity, silence, knowledge,
Smallness that stops errors, and materials,
When heading towards progress,
Engineering is seen everywhere.

With the perspective of nature,
We strive and proceed,
The women who understand the progress,
Let's work and live in this world.

Pravin.J
IV Mechanical C

9. Mechanical tamil Joke

இதோ சில தமிழ் மெக்கானிக்கல் ஜோக்ஸ்:

ஒரு மெக்கானிக்கல் பக்க கார் தொகுத்துக் கொண்டிருந்தான், அந்த கார் தனது அடி நோக்கினால் உடனடியாக கட்டாயமாக இருந்தது. அந்த மெக்கானிக்கல் பக்க கார் பற்றி பரிந்துரைக்கும் நேரத்தில், ஒரு பெரிய கட்டில் கட்டப்பட்டது. அந்த மெக்கானிக்கல் கட்டிலுக்கு மாறியதால் அவன் செயலாக்கத்தின் மூலம் பார்த்து கொள்ள முடியாது.

Pon Naveen. N
IV Mechanical C

10. THE POWER OF DISCIPLINE

The power of discipline lies in its ability to helpus establish consistent routines and habits that lead to long-term success. It creates momentum that fuels further progress and helps us to push through difficult times. Discipline also helps to build resilience and perseverance, enabling us to stay committed to our goals even in the face of setbacks or challenges. By embracing discipline as a tool for achieving our goals, we can create a life of personal fulfillment and sustained success.

Abbhisheak A M
III Mechanical A

11. BE UNIQUE

Today, the word has become more complicated. The lifestyle of people changes day by day with the introduction of the latest technology in our life. For every technology, there must be a small innovative idea. Knowledge is the greatest weapon for decades. We thought that innovative ideas came from the experts, it's a myth. The real fact of innovation is nothing, it is the way to find out complex problems in simple ways by finding the solution compactly. If we look at the history of achievers there must be a lot of failures behind every effort. Remember, failure is a good teacher. If you fail, you have learned a lot of stuff. Keep working, and don't change your path towards success. Remember, your path is unique! Stay focused! Take your failure as a badge and keep progressing. No one can replace your skillset as you can. Knowing your limit is safe is known by everyone. For an achiever, there are no limits. On a single day, an empire wasn't built. Stay progress! Your small task made a big revolution. So,

BE UNIQUE!

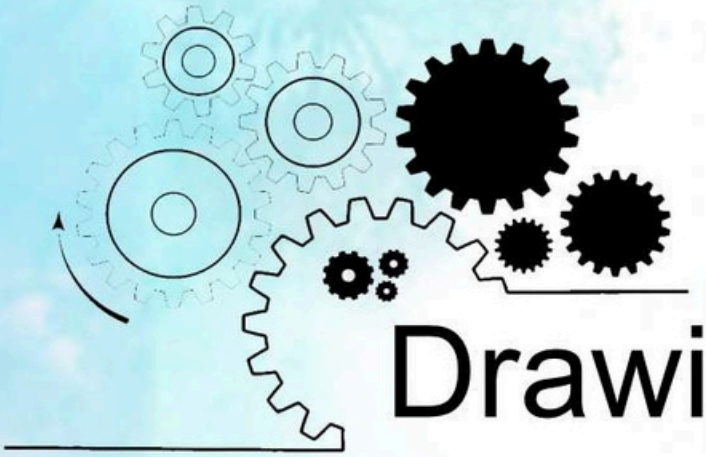
M.Tamu Mishel
III Mechanical

12.அம்மா

அன்புக்கு எடுத்துக்காட்டாய்
ஆவலுடன் - என்னை
இந்த உலகத்தில்
ஈன்ற அன்னையே!
உன் மடி சாய்ந்தால் - துன்பத்திலும்
ஊக்கம் வரும்
என்றும் உன்மடி சொர்க்கம்!
ஏதும் படிக்கடுகோய் - இந்த உலகத்தை
ஐயம் இன்றி எதிர்கொள்ள கற்றுத்தந்தாய்!
ஒவ்வொரு இரவும்
ஓர் விடியலுக்கு - என்று
ஔவியம் நிலைக்க சொல்லித்தந்தாய்!

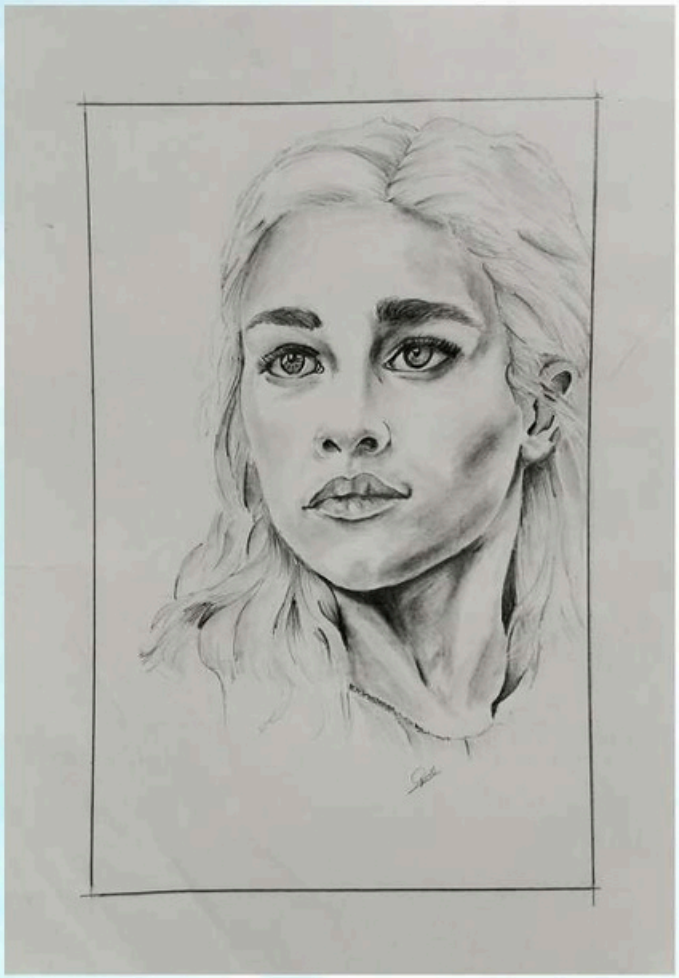
அன்புடன்,
உன் மகன்
எழுதியது.....

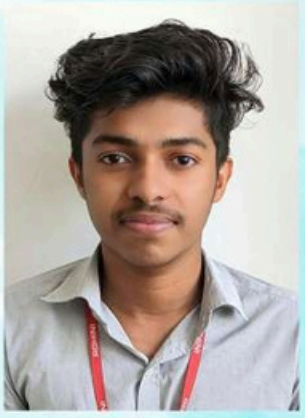
ROJITH .R.E
III Mechanical C



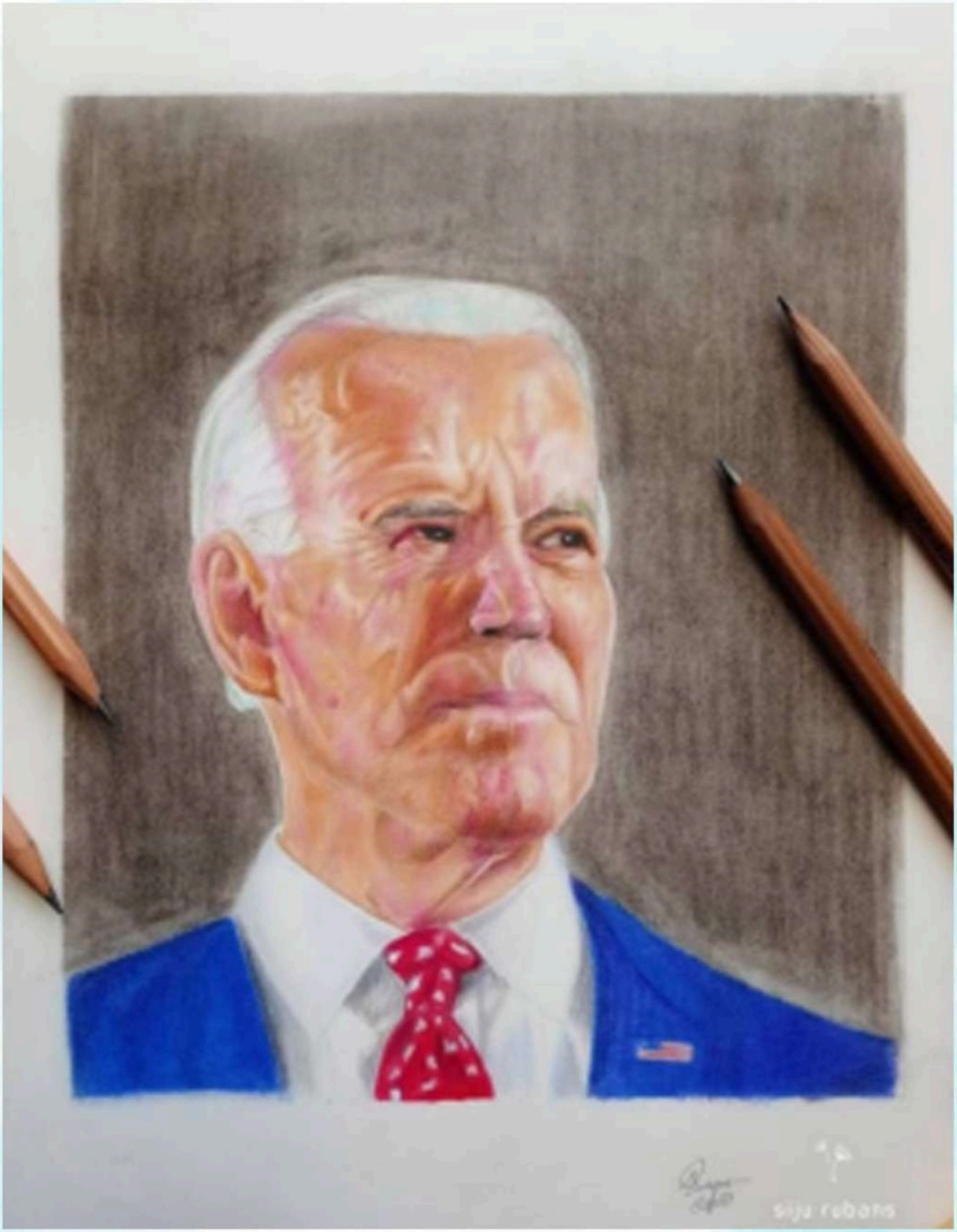
Drawings

Er.V.P.Prawyn Jeba
Assistant Professor
Mechanical Department





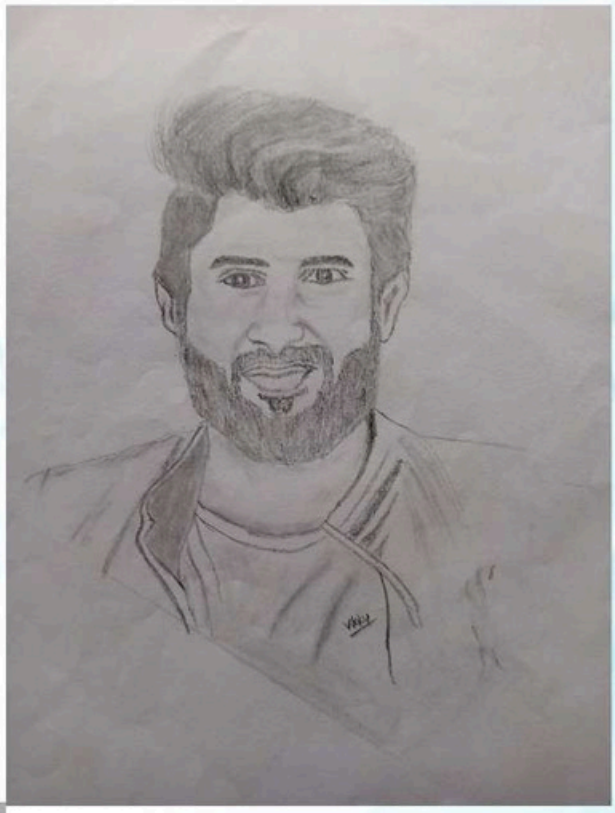
Renjith.R.L
IV Mech C



Sijurubans
IV Mech C

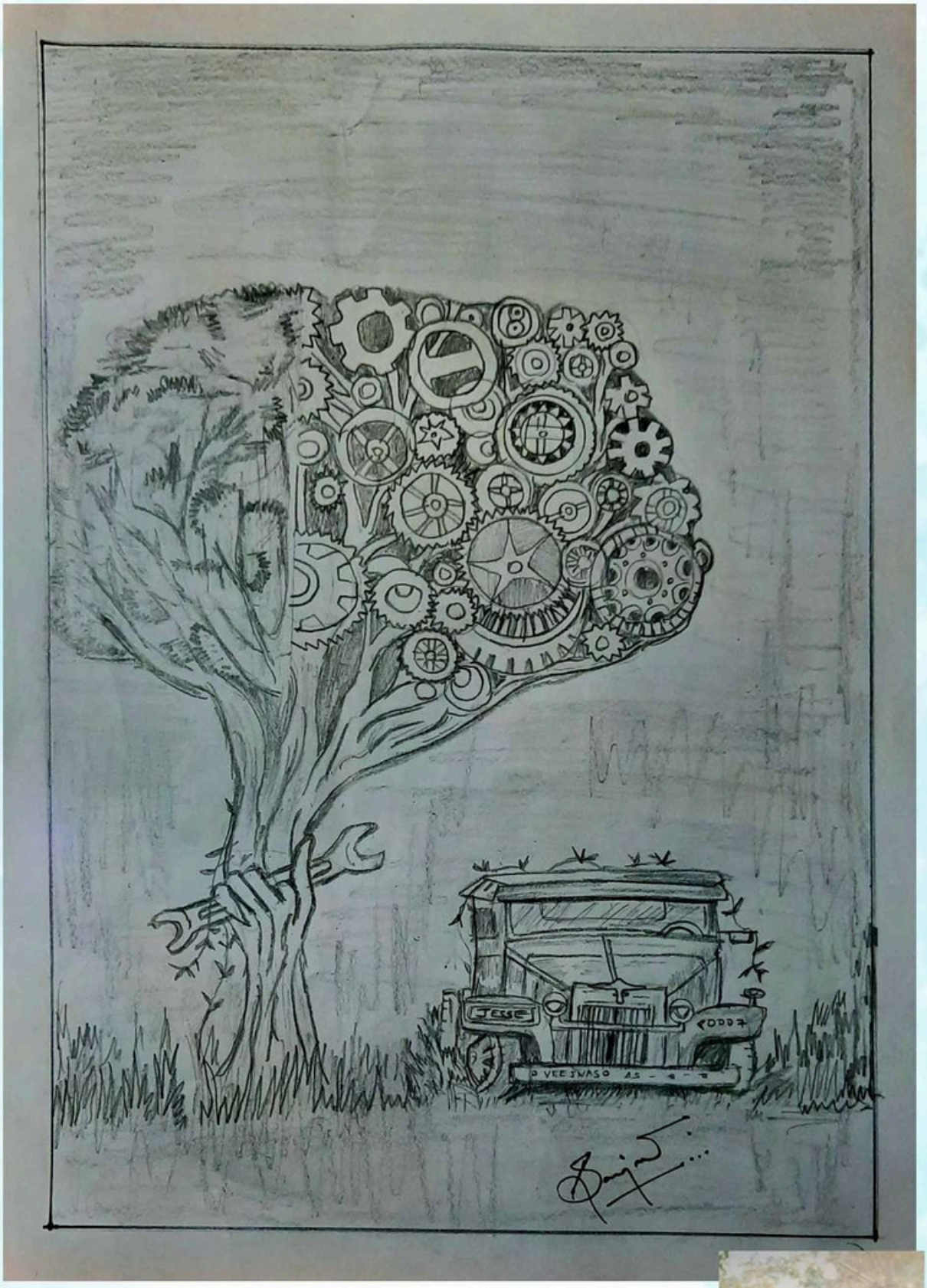
Subin.R
III Mech C

ROJITH .R.E
III Mech C



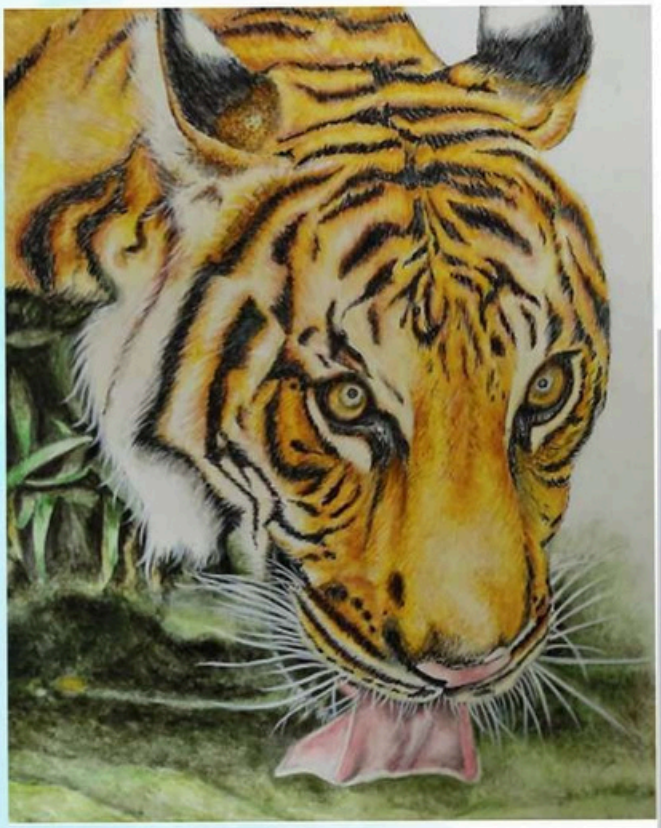
Vikraman J
III Mech C

Jenish K.J
III Mech B



S.L.SANJEEV
III Mech C

Sahaya Riyas R
II Mech B



YUVANJITH R
II Mech C

Viji.P
II Mech C

Harinish M
II Mech C

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