

MEXPRESS

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COMPRESSED AIR CAR



Mr. Nithesh S V
20BME080
2nd Mech.- B

Introduction: This compressed air car is generally a compressed air vehicle which is fuelled by the pressure vessels which is filled with the compressed air and then functions by the expansion and by the release of the air. This happens with the help of the pneumatic motor placed there. This car is different in its way of motion such that it works either only by air or with a Hybrid engine (Combined) with fuel such as Gasoline, ethanol, diesel and so on...

Functions: It works by the basic principle of Thermodynamic process, where the cooling of air takes places while expanding and gets heated up while compressing. But it results in the thermal loss of the compressed air. And with recent developments from Isothermal Compressed Air Energy Storage (ICAES) plants, the storage for this compressed air has been increased by reaching of about four times the capacity factor of Lithium-Ion batteries.



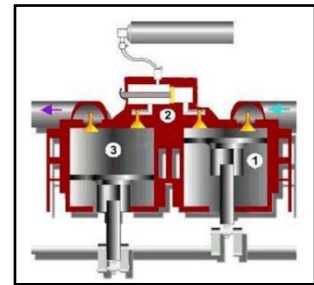
Engine: The final engine which has undergone with CAD and finite element analysis program is the "di pietro" engine. These were finally published in papers by "Jaroslaw Zwierzchowski" in 2017 who is from "Lodz University of Technology". This engine is an eccentric shaft vane motor which uses a low pressured air. The next recently developed engine is "Liquid Piston rotary engine".

Pollution : These cars are not just emission free, also help in conserving electrical energies. The wind turbines attached to the engine helps in generating the power. In a simple way, these cars do not depend on the gasoline stations rather they generate the power the nature itself and does not cause any emissions. This helps in creating an electric grid environment.



It can't be said that it is completely pollution free. Since the intake compressed air undergoes filtration process to protect the engine. So, the discharged air has dust in it, and chances for the presence of lubricants from the engine. So, finally these are emitted back to the environment which may also be said a pollution but in very minimal way comparingly.

Resource usages: These vehicles now considering the resources side, come under the category of circular industries, which has the recycled and bio-based products, which also reduces the usage of electrical energy.



Advantages: There are several factors present that the advantageous.

- The very first is reduction or elimination of fuels like, gasoline, electrical energy, batteries, etc.
- Usage of wind turbines makes the transmission process of energy delivery very easy.
- Increased efficiency comparing to the Lithium-ion batteries.
- Increases the usage of recycled products which gives a very good outcome.
- The products used are very low weight compared to that in Lithium-ion cars, so it plays a major role in increasing the efficiency in a great way.'
- There is no thought of refuelling of even refilling the vehicle, since it requires only wind, solar source.
- Low noise caused, which will surely make the environment in complete silence, where the peace increases.
- This comes with regenerative brakes and suspension which produces low pressure compressed air, then it gets stored in pressure vessel and increases the efficiency.
- Since there is no fuel used which causes fire by pollution, the thought of fire hazards is very less, so prevents the natural accidents and no pollution.
- Finally, this decreases the cost of production, since no complicated components are used no production is required and finally becomes an affordable one for every citizen.
- If in idle for long period, the rate of discharge is very low compared to the Lithium-ion battery cars.

Disadvantages: There are some disadvantages in these cars like, Generally, the turbines have a very good efficiency, but here the turbines used produce a less energy efficiency of the compressed air. This is by comparing with the micro gas turbines. The batteries at least have a specific reading of voltages, draining rate, period of changing and so on. But in this case, we have no clear-cut idea of the lifetime, period, and other stuffs. The pressure of the compressed air gets reduced when raising in hilly areas, so it won't function in slopes.

Dr. Reza Alizade Evrin: In 2020, with still more development, The ICAV (Isothermal Compressed Air Vehicle) which is been the first prototype published by Dr. Reza Alizade Evrin, who is from Ontario Tech University. This ICAV made is built up in a way of using Low pressure air tanks and has the Exhaust air recovery which helps tin powering a paraffin heat exchanger system. This has the global energy efficiency of about 74% (which is 73% to 90% efficient than Li-ion cars). It gives a maximum range of about 140 km. It also has an option of increasing the efficiency and range by the usage of storage tanks which can act as the car chassis structure, having high pressure tanks, placing new rotary engines, increased efficient heat exchanger.

THE FUTURISTIC HYDROGEN POWERED MACHINE



Mr. Nitheeshwar R K
19BME067
3rd Mech. - B

Segway announces the powerful Apex H2 hydrogen motorcycle. Segway-Ninebot has announced that it is building a sports hydrogen fuel cell sports bike, complete with an impossible design and at an amazing price. Segway has been playing with low-performance bicycles lately to accompany its own range of cheap electric scooters, which are widely sold in China. The Apex was announced in 2019, which is a small-looking battery-powered electric "big motorcycle" capable of reaching 125 mph (200 km / h), with a full display of a sports bike.

Now, there is the next Apex H2, which will use the hydrogen-electric hybrid powertrain - the hydrogen gas stored in the tanks will be converted into electrical energy using a fuel cell and a buffer battery, which will enable the electric bike to drive behind the wheel in one way or another. we can't see if there is a chain drive or harp motor or what really happens in these changes. Yes, that is a ventilator in front of the rear wheel, but everything that comes out of it is water vapor.

Segway put the following figures into it: 60 kW (80 hp), which should be a sufficient fist, 150 km / h (-90 mph), which is an unpopular speed, and a second-time 0-100 km / h (0-62 mph) that sounds good. Another key number here is CNY 69,999 - the price, which translates to about US \$ 10,700 and looks crazy cheap in this pioneer bike.



Part of what makes this bike look so bad in gen follows the lack of suspension forks. Instead, the front wheel looks like it is floating in the air, a single side frame on the front and a hidden monoshock arrangement, resembling a single-sided swingarm on the back. Both wheels appear to have a large cover on the right side. It looks completely wild, with a very sophisticated steering system hidden under the front display and the handles come out of holes in the side of the "tank"

section. It will also be challenging for the engineer to design, because that front swingarm not only needs to handle the suspension, but the steering (which can get sloppy on these types of designs, with its many links) and the brakes, which need to be adjusted elsewhere as well.

And it makes us think: could hydrogen motorcycles be a thing? Batteries appear to be aimed at dominating the passenger car market; lithium-ion cells can do the job well at this point and will surely sustain in the future market. But other types of cars will never work with batteries: long-distance electric-powered airplanes and shipping, for example, require energy-saving systems that can carry large amounts of electrons, and in these markets, hydrogen seems to be gaining ground.

But what about motorcycles? Well, maybe there's a two-wheeled H2 case. Electric motorcycles are already a stellar choice, but in sports and pleasure-riding, many riders are looking for something they can use around all day, or quickly fill up at a petrol station. Electric motorcycles, which are heavily loaded, often run out of juice before the petrol brothers start to turn on their headlights, and not everyone wants to sit around for an hour while their bike is charging at a remote charging station.

Hydrogen has two advantages here: it provides much more energy than lithium batteries, and you can fill your tank as fast as a gas tank on your GSX-R if there is a hydrogen station nearby. Leaving aside the fact that it probably isn't at this point, the H2 motorcycle should offer more range in the tank than most charged battery bikes, and let you fill and hit the road again quickly and wisely.

Segway did not release tank size, weight, or Apex H2 range figures. Those will tell us more about how the hydrogen tank, fuel cell, battery and compact discs meet the motorcycle frame, and we will be able to see how the weight is affected. This, along with the idea of how this thing should last, will give us a good idea of whether hydrogen has a future here. To prevent a certain overheating of battery performance, hydrogen could ultimately prove to be the easiest way to power the sports and tourism market, leaving batteries in the active daily use of mobility.

TEACHERS DAY



Mr. M. Shakthieswaran
20BME105
2nd Mech. - C

In hell away from home, a teacher lights the path. A tap to wind our mind, to think of its own. A handbook to live the long life, miseries yonder foretold. That is the magic of the teacher. The 5th is their day.

In India, we mark this occasion on the birth anniversary of Dr Sarvepalli Radhakrishnan. Most people know him to be the second president of our nation. A few might know that he was the first vice-president. Fewer still are likely to know his academic journey. He was first an academican only then a politician. In fact, it is this intellectual fame of his that landed him the top job in our county. He had not the party background of many of his parliamentary peers. Instead, he had held prestigious teaching positions all over the world and had been a strong defendant of the Indian culture. A renowned scholar, loved by his students. When they asked permission to celebrate his birthday, he wished that it be a day for the teachers of

the nation. Ever since it has been, I wonder what wonderful students he had that could bring about such celebration on a national scale.

Teachers, it has been a year since we departed the classrooms. You've been forced to talk to small cameras, with PowerPoint on the screen shown. Sometimes even having to wonder if there is no one in the virtual room. When the third, "can you hear me pa?" goes unanswered, in the voice there is sorrow. We know, we are sorry. We'll try to improve. That is our promise for you today. Happy Teachers Day!



PROGRAMMES ORGANIZED



- A DC Meeting for synopsis titled “Experimental Investigations on the Lubricated wear behaviour of aluminium hybrid composites” submission was conducted on 08-09-2021 for the research scholar of **Dr. C. Velmurugan**, Professor and HoD in the presence of Dr. S. Balasivanandha Prabhu, Anna University, Chennai and Dr. K. Marimuthu, CIT, Coimbatore as DC Members.
- Another DC Meeting for Oral Panel Approval of the thesis titled “Investigation on Mechanical Properties, Wear Behaviour and Machinability studies of titanium Diboride and Boron Carbide reinforced LM13 Aluminium Alloy Hybrid Composites” was conducted on 16-08-2021 for the research scholar of **Dr. C. Velmurugan**, Professor and HoD in the presence of Dr. S. Balasivanandha Prabhu, Anna University, Chennai and Dr. T. Kannan, Professor and Principal, SVS College of Engineering as DC Members.
- An event “CADD Quest” was conducted by Mechanical Engineering Association on 08-04-2021 which was coordinated by **Mr. M. A Vinayagamoorthis**, Assistant Professor - II and **Dr. V. R. Muruganantham**, Associate Professor.



- A webinar titled “Hindrances Faced by Entrepreneurs” was organized by the department on 23-08-2021. Mr. R. Suresh, Unitek Hydraulics, Coimbatore, delivered the webinar. **Dr. S. Balasubramanian**, Associate Professor coordinated the webinar.
- A workshop titled “Design Now, using Autodesk Fusion 360”, in association with ICT Academy was conducted on 28-08-2021 was organized by the department on 28-08-2021. Mr. P. Kranthi Kumar, Senior Trainer, ICT Academy and **Mr. R. S. Mohankumar**, Assistant Professor coordinated the department.



FACULTY AS RESOURCE PERSONS



- **Dr. B. N. Sreeharan**, Assistant Professor - II was the resource person in a Webinar titled "How to prepare and publish a paper?" conducted by Sri Eshwar College of Engineering, Coimbatore on 09-08-2021.

- **Prof. Dr. S. Bhaskar**, Associate Professor was the resource person in the following programmes

- Online training workshop on POs and Justification for Mapping COs with POs organized by Sakthi Polytechnic College on 02-08-2021.
- Webinar on Indirect Assessment Tools conducted by NGM College, Pollachi on 15-07-2021.
- Webinar on Principles and Qualities for a great personal and professional career organized by Kongu Engineering College, Perundurai on 24-08-2021.
- Online training workshop titled Insight into NBA Accreditation for Polytechnic Colleges organized by Arulmigu Palaniandavar Polytechnic College, Palani on 27-08-2021.



- **Dr. V. Muthukumar**, Professor was the DAB Expert member for Dr. NGP Institute of Technology Coimbatore on 13-08-2021

- **Dr. B. Senthilkumar**, Associate Professor was the resource person for Webinar titled "Additive Manufacturing" organized by Kumaraguru College of Technology on 14-08-2021.



- **Dr. T. Karuppusamy**, Assistant Professor - II was the resource person for a webinar titled "Placement input on Kinematics of Machinery" on 31-08-2021.

PAPERS PRESENTED



Dr. S. Bhaskar, Associate Professor and **Dr. R. Manivel**, Professor presented papers titled "Action Research on Learning Difficulties of Calculus for I year Engineering Students" and "A study using the TQM tool - Prioritization Matrix for ranking the expectations of PG – E&T students from educational institutions" in the International Conference ICERLT conducted by Kumaraguru College of Technology during 25-08-2021 and 26-08-2021



PAPERS SUBMITTED



- **Dr. B. N. Sreeharan**, Assistant Professor - II submitted two papers titled "A Novel Way of using DEAR Algorithm for selecting Suspension Coil Spring Material" and "Application of Lean Thinking in enhancing Productivity for an Automotive Welding Fixture Manufacturing Industry" in the scopus indexed international journals.

PAPERS PUBLISHED

- **Mr. B. Jeeva**, Assistant Professor, published a paper entitled "Measurement of displacement in spatial correlation velocimetry by pixel shifting method", in the AIP Conference Proceedings 2352, 030022-1-030022-5, <https://doi.org/10.1063/5.0052366>.



- **Dr. M. Balaji**, Associate Professor and **Dr. B. N. Sreeharan**, Assistant Professor - II published a paper entitled "Supply Chain Management in Automotive Industry – A Review, in the Transactions on Innovations in Science and Technology Journal, Vol. 5, Issue No. 2.



- **Dr. V. Manivelmuralidharan**, Assistant Professor – II published a paper entitled "A Review of Pneumatic Braking System in Automobiles in the International Research Journal of Engineering and Technology (IRJET), Volume: 08 Issue: 08.

- **Mr. M. A. Vinayagamoorthis**, Assistant Professor – II published following papers

- Wind Mill Blade Design-A Review, International Research Journal of Engineering and Technology (IRJET), Volume: 08 Issue: 08.
- Review on Influence of Residual Stress in Metal Additive Manufacturing Process, Journal of Emerging Technologies, and Innovative Research (JETIR), Volume 8, Issue 8, Pg. No. c100-c107, (ISSN-2349-5162).
- A Review on Biodiesel Production, International Journal of Engineering Science and Computing (IJESC), Volume 11, Issue 8, Pg. No. 28664-28669, ISSN 2321 3361.



PAPERS REVIEWED



- **Dr. P. S. Samuel Ratna Kumar**, Assistant Professor reviewed following papers
 - The Morphological Effects of Hydrothermal Carbon on Mechanical, Tribological and Corrosion Properties of AlSi12 Composite for Surface Topography: Metrology and Properties.
 - Effect of sintering mechanisms on the mechanical behaviour of SiC and Kaoline reinforced Hybrid Aluminium metal matrix composite fabricated through powder metallurgy technique for Silicon.
 - IOT based Patient Health Monitoring System with Heart Rate and Oximeter Lower Alert System for Materials Today: Proceedings.
 - Analysis of Air Passengers Waiting Time in Airport Check-In Counters for Materials Today: Proceedings.
 - Comparative Analysis on Tribological Characteristics of Thermal Sprayed Coatings Prepared from Conventional and Nanocomposite Mixed Ceramic Powders for Advances in Materials Science and Engineering.
 - Carbon fibre – graphene composite PLA material for COVID shield frame for Material Science and Engineering Technology.



- **Dr. S. Balasubramanian**, Associate Professor reviewed a paper titled "Necessary conditions of the shape, length, and proper way of wearing for a non-medical mask" for Textile research journal.

AWARDS APPLIED

Mr. B. Jeeva, Assistant Professor applied for the following KCT- Teachers Day Awards 2021.

- Institutional Development
- Award for Merit- Teaching
- Award for Merit- Innovative Knowledge Transfer



INDUSTRY LINKAGE



Dr. V. R. Muruganantham, Associate Professor and **Mr. P. D. Devan**, Assistant Professor has organized Two weeks virtual internship program for II & III-year Mechanical Engineering students (61 students) at TVS Training and Services Ltd., Chennai.



PATENT PUBLISHED



Dr. K. K. Arun, Assistant Professor - III published a patent titled "A System for Server-Driven Data Synchronization In Iot Connectivity and Method Thereof" bearing no. 202141034610 A.

PROGRAMMES ATTENDED

Mr. S. Sivakumar, Assistant Professor - II acted as examiner for "Central Valuation Phase-III" from 05-08-2021 to 09-08-2021, organized by PSG Institute of Technology, Coimbatore.



Mr. S. Rajesh, Assistant Professor participated in an FDP on "Research Applications in Artificial Intelligence and Machine Learning for Mechanical Engineers" from 09-08-2021 to 14-08-2021, organized by SRM Institute of Science and Technology, Kattankulathur – 603203, Tamil Nadu, India.

Mr. R. S. Mohan Kumar, Assistant acted as examiner for "Central Valuation Phase-III" from 05-08-2021 to 09-08-2021, organized by PSG Institute of Technology, Coimbatore.



Mr. P. Pradeep, Assistant Professor participated in an FDP on "Research Applications in Artificial Intelligence and Machine Learning for Mechanical Engineers" from 09-08-2021 to 14-08-2021, organized by SRM Institute of Science and Technology, Kattankulathur – 603203, Tamil Nadu, India.

Mr. P. D. Devan, Assistant Professor participated in a Training on "Virtual Internship Program on Electric Vehicle" from 19-07-2021 to 26-07-2021, organized by TVS Training and Services Ltd., Chennai and he also FDP on "Research and Innovation with 3D Printing" from 02-08-2021 to 06-08-2021, organized by Government College of Technology, Coimbatore.





Mr. M. A. Vinayagamoorthi, Assistant Professor - II participated in a One-week AICTE Training and Learning (ATAL) Academy sponsored online Faculty Development Program on "Design Thinking and Product Development" from 23-08-2021 to 27-08-2021, organized by NIT, Arunachal Pradesh. He also participated in FDP on "Research and Innovation with 3D Printing" from 02-08-2021 to 06-08-2021, organized by Government College of Technology, Coimbatore.

Mr. K. Manikanda Prasath, Assistant Professor participated in FDPs on "Recent Advancements in Computer Science and Technology" from 02-08-2021 to 06-08-2021, organized by Chadalawada Ramanamma Engineering College (Autonomous), Tirupati, and on "Financial Planning and Smart Investments" from 13-08-2021 to 14-08-2021, organized by Rathinam College of Arts and Science, Coimbatore. He also participated in another FDP on "Emerging Technologies in Automotive Industry" from 16-08-2021 to 20-08-2021, organized by Vallurupalli Nageswara Rao Vignana Jyothi Institute of Engineering and Technology, Coimbatore. Further, he participated in a Webinar on "Fundamentals of Research Article Writing" on 19-08-2021, organized by Elsevier, India.



Mr. B. Jeeva, Assistant Professor participated in an FDP on "AICTE Moe-IIC Ambassador program" from 30-06-2021 to 31-07-2021, organized by AICTE-MHRD Innovation Cell (MIC), AICTE, New Delhi. And he also participated in a Competition Mentor on "Mentor for guiding team from KCT at YuVA Innovator Challenge 2021" from 04-08-2021 to 31-08-2021, organized by YuVA Incubated, KITES Education, Churu (Rajasthan).

Dr. V. R. Muruganantham, Associate Professor participated in a Training on "Virtual Internship Program on Electric Vehicle" from 19-07-2021 to 26-07-2021, organized by TVS Training and Services Ltd., Chennai and in an FDP on "Research and Innovation with 3D Printing" from 02-08-2021 to 06-08-2021, organized by Government College of Technology, Coimbatore.



Dr. V. Manivelmuralidaran, Assistant Professor - II completed an Online course on "Principles of Industrial Engineering" from 02-05-2021 to 23-08-2021, organized by NPTEL, India and participated in an FDP on "Applications of Artificial Intelligence in Modern Manufacturing" from 03-08-2021 to 07-08-2021, organized by Karunya University, Coimbatore.

Dr. T. Karuppusamy, Assistant Professor - II acted as examiner for "Central Valuation Phase-III" from 05-08-2021 to 09-08-2021, organized by PSG Institute of Technology, Coimbatore.





Dr. S. Thirumurugaveerakumar, Associate Professor participated in an FDP on "Research Applications in Artificial Intelligence and Machine Learning for Mechanical Engineers" from 09-08-2021 to 14-08-2022, organized by SRM Institute of Science and Technology, Kattankulathur – 603203, Tamil Nadu, India.

Dr. S. Balasubramanian, Associate Professor participated in a Webinar on "Artificial Intelligence in Robotics - A Road Map" on 14-08-2021, organized by CIET, Coimbatore and he also participated in an FDP on "Innovation Ambassador training (Advanced Level) by MoE's Innovation Cell & AICTE" from 30-06-2021 to 30-07-2021, organized by MoE's Innovation Cell & AICTE, AICTE, New Delhi.



Dr. R. Manivel, Professor participated in a Seminar on "IPR: key to India's Future Journey" on 14-08-2021, organized by TURNIP Innovations, Mumbai.

Dr. P. S. Samuel Ratna Kumar, Assistant Professor participated in a Webinar on "Innovations in Online Teaching, Learning and Evaluation (IOTLE-2021)" from 05-08-2021 to 07-08-2021, organized by Karunya University, Coimbatore.



Dr. N. Sangeetha, Associate Professor (SRG) participated in an FDP on "Research Applications in Artificial Intelligence and Machine Learning for Mechanical Engineers" from 09-08-2021 to 14-08-2021, organized by SRM Institute of Science and Technology, Kattankulathur – 603203, Tamil Nadu, India.

Dr. M. Thirumalaimuthukumar, Assistant Professor - II participated in an FDP on "Research and Innovation with 3D Printing" from 02-08-2021 to 06-08-2021, organized by Government College of Technology, Coimbatore.



Dr. M. Ramesh Kumar, Assistant Professor participated in an FDP on "Research Applications in Artificial Intelligence and Machine Learning for Mechanical Engineers" from 09-08-2021 to 14-08-2021, organized by SRM Institute of Science and Technology, Kattankulathur – 603203, Tamil Nadu, India.



Dr. M. Balaji, ASP participated in an FDP on “Applications of Artificial Intelligence in Modern Manufacturing” from 03-08-2021 to 07-08-2021, organized by Karunya University, Coimbatore.

Dr. B. N. Sreeharan, Assistant Professor - II participated in Webinars on “Vedic Mathematics” on 19-08-2021, organized by Sateesh Academy, Hyderabad, “Fundamentals of Research Article Writing” on 19-08-2021, organized by Elsevier, India and “Application of Expert Systems in Mechanical Engineering” on 28-08-2021, organized by Sri Nehru College of Engineering and Technology, Coimbatore. Further, Dr. Sreeharan also participated in FDPs on “Foundation of Data Science & its applications” from 26-07-2021 to 30-07-2021, organized by Gandhi Delhi Technical University for Women., Delhi and “Financial Planning and Smart Investments” from 13-08-2021 to 14-08-2021, organized by Rathinam College of Arts and Science, Coimbatore. He also completed an online course on “Introduction to Business Intelligence” from 19-07-2021 to 05-08-2021, organized by Corporate Financial Institute, Vancouver.



PAPER PUBLICATIONS WITH STUDENTS

Mr. M. A. Vinayagamoorthi, Assistant Professor - II along with Mr. P. Kavinprabhu, Mr. M. G. Kanish, Mr. V. L. Ananth, published a paper titled “A Review on Biodiesel Production”, International Journal of Engineering Science and Computing (IJESC), Volume 11, Issue 8, Pg. No. 28664-28669, ISSN 2321 3361.

Dr. M. Balaji, Associate Professor and **Dr. B. N. Sreeharan**, Assistant Professor - II along with Mr. A. Sameer Ahamed Khan, Mr. B. Ibrahim Basha published a paper titled, “Supply Chain Management in Automotive Industry – A Review”, Transactions on Innovations in Science and Technology, Vol. 5, Issue No. 2.

Mr. M. A. Vinayagamoorthi, Assistant Professor - II along with Mr. K. Pravin, Mr. J. Venkatesh, Mr. T. Thirudhakshin, published a paper titled “Windmill Blade Design-A Review”, International Research Journal of Engineering and Technology (IRJET), Volume: 08 Issue: 08 | Aug 2021.

Mr. M. A. Vinayagamoorthi, Assistant Professor - II along with Mr. V. R. V. Avinash Roshan, Mr. T. Deepan Issac, Mr. A. Shreeram, published a paper entitled “M Review on Influence of Residual Stress in Metal Additive Manufacturing Process”, Journal of Emerging Technologies and Innovative Research (JETIR), Volume 8, Issue 8, Pg. No. c100-c107, (ISSN-2349-5162), August 2021.

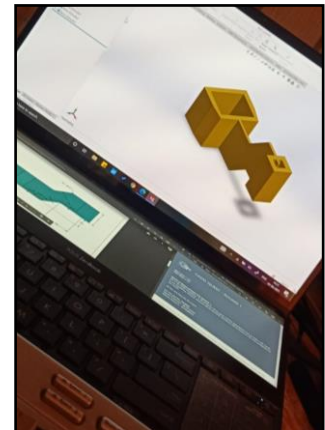
CADD QUEST

CADD QUEST is the Series competition, in which rounds will have a unique theme with a variety of components but share the same general framework.

This event Contains two rounds, i.e.,

- ✚ 2D Sketch to 3D Modelling
- ✚ Assembling the part

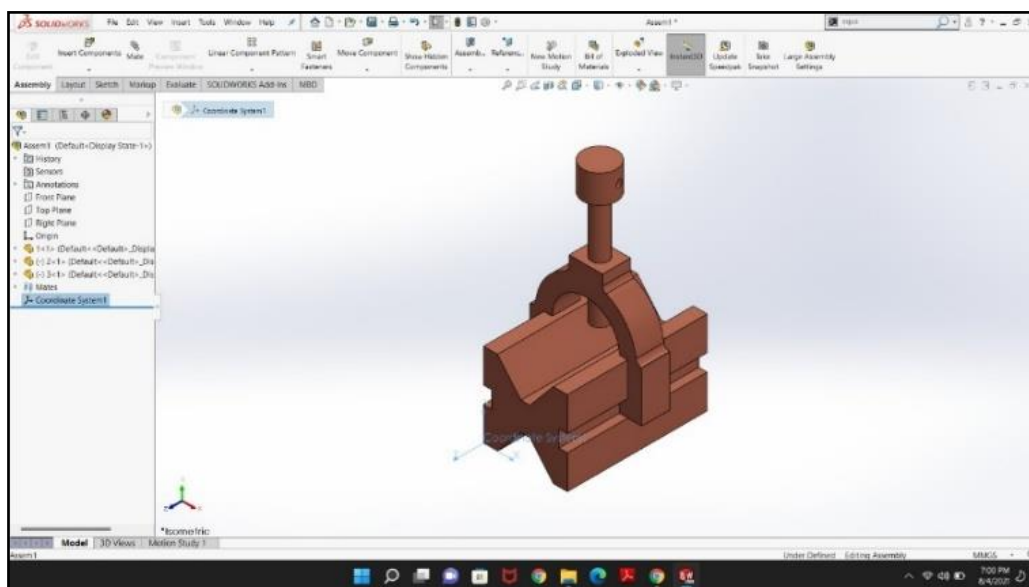
CADD QUEST was conducted on 4th August 2021 through MS form. Questions are selected from the basic Mechanical Engineering tools and its applications. Both rounds are happened in the same day. All the Registered participants are allowed to attend the round 1. In Round 1, A 2D Drawing will be given and the participants must prepare a 3D model by using any Modelling Software. Material will be specified in the question. Additional task like calculating the masses need to be done by the participants. The participants who won the round 1 are allowed to participate in the Round 2. In Round 2, participant must prepare the 3D model from the drawing file given and then make an assembly by applying the mating condition. The participant who won Round 2 will be the Winner of this event.



Winner: RAAJ KHISHORRE K R (19BME012)

Runner: AVINASH ROSHAN V R V (18BME045)

This event was successfully organized by MEA, coordinated by Mr. Manav R Samant and Mr. Kishore Krishna. More than 50 have participated and benefitted from the event.



RIGHT TO REVERSE

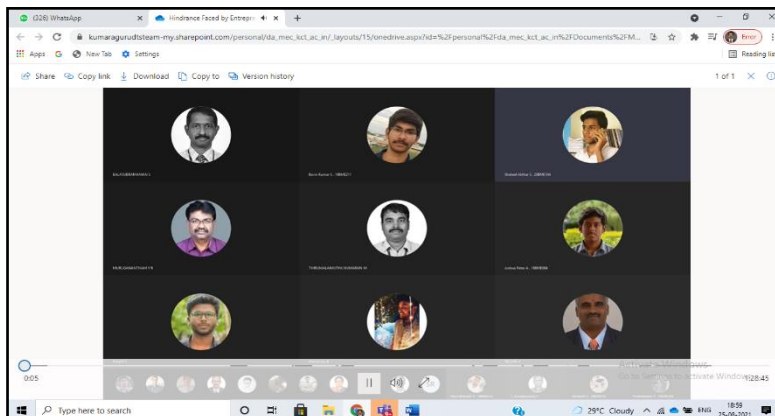
An Event was conducted to celebrate the achievements and sacrifices made by Indian Freedom Fighters. **MEA** planned to conduct this event by giving a technical word in Reverse reading which helps our brain be more active. Right To Reverse was conducted on 15th August 2021 through MS form. Questions are selected from the basic Mechanical Engineering application words.

Winner: Mrs RAKSHITHA R S (20BEI036)

This event was successfully organized by MEA, coordinated by Mr. Ashwinth K V. More than 20 have participated and benefitted from the event.

HINDRANCE FACED BY ENTREPRENEUR

The entrepreneur takes business risks in the hope of making a profit. But they also face the hindrance in it. So, by this Webinar the participant got clarified regarding the Hindrance faced by Entrepreneur.



This webinar was held on 23rd August 2021 at 11:00 am via MS Teams. The guest speaker gave a wonderful talk about the Hindrance that faced by the Entrepreneur to the students. **Mr. R. Suresh** completed his bachelor's in mechanical engineering at Sri Ramakrishna Engineering College. Now he is one of the Partner in Unitek Hydraulics which having their turnover is about 15 crore per annum.

TOTAL NUMBER OF PARTICIPANTS: 29

FACULTY COORDINATOR: Dr. S. Balasubramanian, ASP

STUDENT COORDINATOR: Mr. B. Hemavijay – 2nd year

Mr. P. Kavin Prabhu – (18BME008) of final year Mechanical Engineering A section attended a webinar named as **“Trends and Challenges in EV”** organized by KPIT Sparkle 2022 on 09/08/2021 and also, he published a paper entitled **“A Review on Biodiesel Production”** in International Journal of Engineering Science and Computing on 20/08/2021 with Guidance from Mr. M. A. Vinaayaga Moorthi (Assistant Professor II).



Mr. M. Barani – (19BME091) of Third year Mechanical Engineering B section attended a webinar named as **“How to design and fabricate eBaja vehicle”** organized by SAEINDIA on 25/08/2021



Mr. A. V. Charankumar – (18BME140) of final year Mechanical Engineering C section attended an Event called as **“NYC Hack 3D”** on 26/07/2021



Mr. P. Prabhakaran – (19BME229) of Third year Mechanical Engineering C section attended a Workshop named as **“AutoCAD 2D”** on 20/08/2021 organized by Anjaneya Puli.



Mr. Praveen B - 18BME092, **Mr. Kavinprabhu P** – 18BME008, **Mr. Rakshit Stephen T** – 18BME132, has been selected as the **Associate Technical Consultants** in **VURAM Technologies**.



Mr. Kaaviyan - 18BME061, has been selected as the **DevOps Engineer** at **MITSOGO**.



Mr. Rakshit Stephen T - 18BME132, **Shrinick P B** - 18BME013 has been selected as the **interns** in **ZOHO**.



EVOLUTION OF BATTERIES



Mr. R. Aswin Baalaje
19BME069
3rd Mech. - B

In the world's environment, lot of things causes pollution. One of such things that was produced by the humans to satisfy the transportation need is vehicle. Vehicle is produced for the benefit of humans, but it exploits the nature by releasing CO₂. The vehicle that uses fossil fuels as the fuel causes this problem. The availability of fossil fuel will vanish in our nearby future. So, the humans seek for the alternate source of fuel which will energise the vehicle. As a result, Electric Vehicle came as alternative. The count of e-vehicles in the roads of the developed countries are higher than other countries. In India it is in nascent stage due to various reasons. One of the reasons is Durability. Batteries decide this factor. Lot of evolutions from non-rechargeable batteries to rechargeable batteries as helped a lot in the development of Electric Vehicles.

Electric vehicles first operated by non-rechargeable batteries then replaced by Ni-MH batteries, Lithium ions battery and so on. In which,

Lithium-ion Batteries are most widely used battery in current Electric Vehicle market. Li-ion batteries are more stable and can be recharged hundreds of times. Compared to conventional rechargeable batteries, they feature a better energy density, voltage capacity, and lower self-discharge rate. A single Lithium-ion cell has a longer charge holding capacity than other battery types, this results in higher power efficiency. Lithium-ion batteries have better energy densities than lead-acid or nickel-metal hydride batteries, so that the battery size can also be reduced while maintaining the same storage capacity. This technology offers the best "charge to weight" solution, meeting one of the most essential requirements for a battery utilised in the electric car sector, allowing Ni-MH batteries to be readily replaced.

Ni-MH batteries were the most sophisticated technology used in hybrid and electric vehicles at the start of the 2000's and were considered the first step toward the technology utilised today.

In comparison to the batteries that were utilised at the time, Ni-Cd and Lead-Acid batteries, Ni-MH technology met the standards that were set on batteries that were designed to be used in vehicles.

But it was replaced by lithium-ion batteries due to its high efficiency.

- ✚ A single Li-ion cell can provide 3.7 volts, but two Ni-MH cells can only provide 2.4 volts.
- ✚ Faster Charging: Lithium-ion batteries may be charged in 1–3 hours, depending on capacity. This is much faster than the 10–12 hours needed for Ni-MH batteries.
- ✚ Higher Energy Density: When compared to a Ni-MH battery, this indicates that the battery can hold more charge per gram.

- ✚ Lack of memory effect - to gradually lose the maximum energy capacity in case of repeatedly recharge, without being totally discharged, resulting an increased life cycle.

- ✚ They perform the best at deep discharge applications compared to Ni-cad or Ni-MH batteries.

One of the main reasons that we use Lithium – ion battery due to its higher energy density capacity and weight to charge factor.

It also as certain disadvantages. Safety is an issue with lithium Ion. All lithium-ion batteries must be controlled with an integrated circuit to control input and output voltage. If the circuit is not present, the cell could have thermal runaway. We all heard of laptop batteries catching fire. That is an instance of thermal runaway. Another safety issue is water. In the presence of H₂O, lithium-ion will oxidize extreme rapidly (hint explode).

So, lot of new batteries are in experimental stage for the alternatives for Lithium-ion battery.

OFF-SHORE STRUCTURE REVIEW



Mr. Saran K
20BME103
2nd Mech. C

CONSTRUCTION: Offshore construction is the installation of structures and facilities in a marine environment, usually for the production and transmission of electricity, oil, gas, and other resources. It is also called maritime engineering. Construction and pre-commissioning are typically performed as much as possible onshore. To optimize the costs and risks of installing large offshore platforms, different construction strategies have been developed.

One strategy is to fully construct the offshore facility onshore and tow the installation to site floating on its own buoyancy. Bottom founded structure is lowered to the seabed by de-ballasting, whilst floating structures are held in position with substantial mooring systems. The size of offshore lifts can be reduced by making the construction modular, with each module being constructed onshore and then lifted using a crane vessel into place onto the platform. Several very large crane vessels were built in the 1970s which allow very large single modules weighing up to 14,000 tonnes to be fabricated and then lifted into place.

Oil platforms are key fixed installations from which drilling and production activity is carried out. Drilling rigs are either floating vessels for deeper water or jack-up designs which are a barge with liftable legs. Both types of vessels are constructed in marine yards but are often involved during the construction phase to pre-drill some production wells.



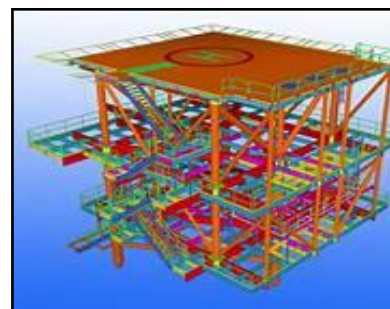
PROCEDURE: Due to renewable energy, the European Union power sector is moving away from fuel oil and coal, with both technologies continuing to decommission more than they install. The fossil fuels are now becoming scarcer and increasingly expensive, the world seeks a solution that serves the interests of the economic development and preservation of nature. This concern of the world is leading to a growing demand for renewable energy sources, within an integrated perspective of energy use and environmental preservation.



Thus, wind energy plays an increasingly important role in the global energy landscape as it is one of the energy sources that has less impact on nature. The growing wind energy demand has led to a great development of the technology of wind turbines and the supporting columns, seeking to greater energy production, a reduction in installation costs and cheaper maintenance. Due to the existence of better wind resources in high sea locations, the wind farms are now moving further away from the shore, into deeper water depths and increasing distances from land. These requires new challenging conditions for wind turbines' projects, that now must be designed to resist to some of the most severe conditions existent in the globe, i.e., offshore environment. In fact, wind power is now seen as one of the most promising renewable energy sources, characterized by a mature technology developed mainly in the EU and the USA.



Onshore wind turbines have been the world's fastest growing energy source, therefore, most wind farms installed are located onshore. Relative to the construction method, the onshore wind farms have lower costs than offshore. Along the years, the efficiency of wind turbines has increased significantly as wind turbines became bigger, but for onshore wind farms there are some restrictions such as the limitations of land, as dense populations areas with so many buildings compromise the development of onshore wind farms, since so many square meters of land are needed to install this equipment; the turbines are limited to size, due to logistic problems during transportation of large wind turbine components. However, in offshore this limitation does not exist, as it is easy to transport large structures in vessels and barges; the visual aspect is also a problem, because the wind farms ruin the beauties of a landscape, if the wind farms are installed near population centres, the problem with noise pollution is very relevant.



THE PROXY OF SONAR DETECTION



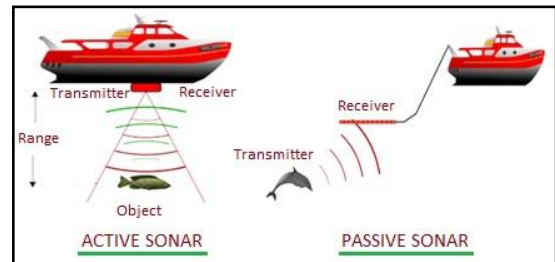
Mr. S. Jayabalu
19BME219
3rd Mech. - A

Do you know? how Americans protected their submarines from Japanese navy during the time of second world war.

Ships use sonar to detect the object inside the sea. There are two types of sonars

SONAR:

Sonar is a technique for detecting and determining the distance and direction of underwater objects by acoustic means. There are two types of sonar Active and Passive

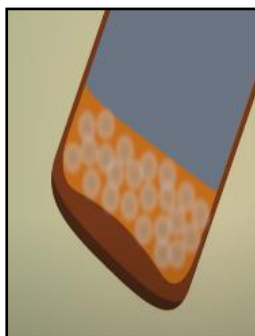
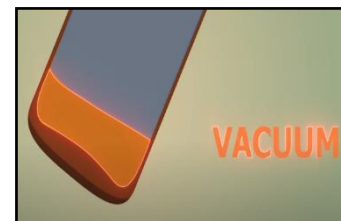


ACTIVE SONAR:

Active sonar is emitting pulses of sounds and listening for echoes. Sound waves emitted by or reflected from the object are detected by sonar apparatus and analysed for the information they contain. Modern active sonar systems use an acoustic transducer to generate a sound wave which is reflected from target objects.

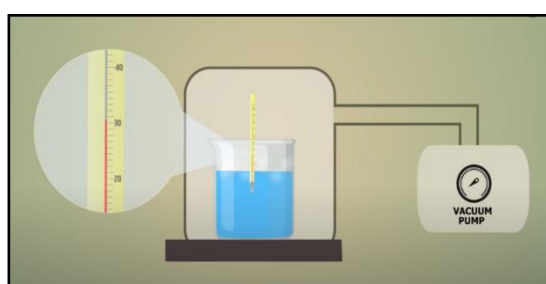
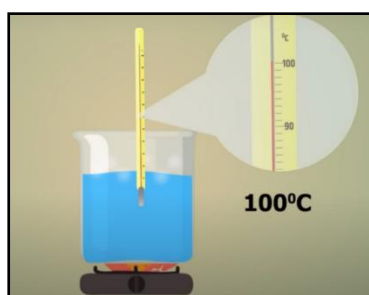
PASSIVE SONAR:

Passive sonar is essentially listening for the sound made by vessels. These are capable to listen the minute sound. During the period of second world war passive sonars are used. Americans took the advantages of this, and they ambushed their submarines under the troop of sea organism 'Mantis Shrimp'. There is a science behind that organism.



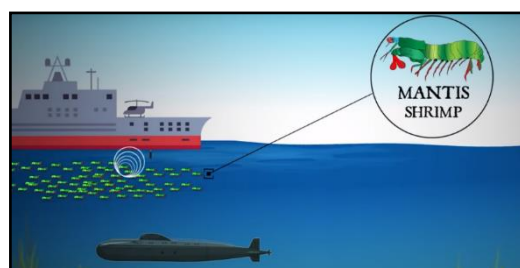
Consider a bottle having water. This bottle is made of glass. If you give high impact on the top of a glass bottle by our hands, the bottom of that bottle will break. There is a science in behind this reaction. By giving impact force on the top of glass bottle small bubbles formed on the bottom of the bottle. During this time the bottle moves slightly downwards from water due to this vacuum created on the bottom of the bottle.

We already know that we can boil the water by supplying low heat by reducing the surrounding pressure. During the formation of vacuum inside the bottle, low pressure will create on that vacuum. So, the water nearest to the vacuum created will get boiled and evaporates quickly which creates bubbles. These bubbles are called cavitation bubbles. These bubbles burst with heavy sound and shock waves will be produced. These shock waves are same as the shock waves produced by bomb blast. So, the bottom of glass will break. This science behind the mantis shrimp.



MANTIS SHRIMP :

Mantis shrimp lives in tropical and sub-tropical area. Average length of this shrimp is 15 cm. Their eyes have capability to see more colours than humans. Both eyes are operated independently. They have powerful Claws which helps them to attack very fast. That is 50 times faster than eye blink. The speed is equal to acceleration of 22 mm calibre bullet. attack when they see enemy or prey. On that time cavitation bubbles are created and burst with heavy power sound creating the shock waves, that burst of cavitation is more powerful than the burst inside that bottle. This is because, during that time of attack large force will act on it, Due to this small vacuum will be created due to that large force, by this we already know that water will be vaped.



So, bubbles produced shock waves are produced. On that time temperature raise up to 4700 °C for a fraction of seconds. This temperature is close to sun's temperature (5500° c). We can see light during that time of attack because of bursting bubbles called sonoluminescence. Americans ambushed their submarines under the troop 'Mantis Shrimp'. The passive sonar can't listen the sound of submarines.



Japanese mistakenly thought there is a troop of Mantis shrimp. By this, the Mantis Shrimp helps Americans to protect their submarines from Japanese's navy.

MANKAME- "DREAMS BEYOND THE FUTURE"



Mr. Nitheeshwar R K
19BME067
3rd Mech. - B

The Indian company Mankame operates an electric motorcycle with a spec that seems to be a dream come true. Their EP-1 has got a distance of 500 km on paper, and its 40-kW car controls a top speed of 250 kph. Their basic price is 8,500 euros in a less powerful type but even the upper trim has the right price. This young company from India wants to hit the country's largest two-wheeled market with a blossom of blatant visibility. Their motorcycle rides near the stadium and aims to be at the top of its league when it comes to performance.

The 500-kilometer (300-mile) range is particularly eye-catching and Mankame says it's all in Samsung's high-powered battery. Cool the liquid and start to get the secret lies in their custom BMS. The whole battery weighs 80 kilograms, about half of all a large motorcycle 180 kg. In view of this, the Zero Motorcycle bike offers a distance of 260 miles and carries an additional "charging tank".

However, Mankame bases his data on computer simulation so far rather than riding the real world so it remains to be seen what EP-1 will be able to do. Even in simulation, a distance of 500 km is only reached at a low speed of around 80 kph, although enough to drive on country roads for example.

In Mankame, and the electric car is amazing, it is also written on paper right now, as it has 40 kW and a top speed of 250 kph in the top trim. Overall, the start-up works on three of their EP-1 options.



Option 1 will cost \$ 8,500 with 16 kW AC motor induction games and a 12.16 kWh pack, which covers a distance of 320 km with a typical speed of 70 kph and a maximum speed of 120 kph. At \$ 10,500 the EP-1 comes with a 20-kW brushless DC motor and a 14.97 kWh battery. The distance then rises to 400 km at a top speed of 180 kph. Then there is the high resolution with an 18.4 kWh battery and a 40-kW non-magnetic motor, which makes that dream come true which is not good to have - in the end.

E BIKE GO RUGGED G1



Mr. Nithesh S V
20BME080
2nd Mech.- B

Introduction:

E Bike Go, is an Indian manufacturing company, who has launched their "Rugged" electric moto-scooter. "Irfan Khan" is the founder and the CEO of the EbikeGo company. He stated that "this bike would change the face of E-mobility in India". The Rugged has been manufactured in Coimbatore, Tamil Nadu. It is in conjugation with Boom Motors. They have their expectation to reached nearly Rs. 1 lakh of vehicle production as soon as possible. They are also planning for building nearly 3000 charging stations.

Specifications and features:

It comes in two different variants named as G1 which is priced at Rs. 79,999 and G1+ is priced at Rs. 99,999. The very first unique is that Rugged comes with their own 1st manufactured Hub motor. Next feature is that this bike user can switch from 1 battery to another battery without getting off, since it is upgraded with an advanced 2-wheeler IOT system. It is claimed to give a range of about 160 km on a single full charge and can reach its top speed as 70 kmph. It has the Rugged App, which is used to unlock and drive the bike. It has anti-theft feature also.

It has a boot space of about 30 liters. And the chassis is made up of cradle chassis and covered with steel frame.

The motor comes with a 3-kW motor which has the capacity to reach the top speed of about 70 km/hr. The battery is split as 2 x 2 kWh, which is replaceable. The battery takes 3.5 hrs for full charge and range is nearly about 160 kms.



Warranty:

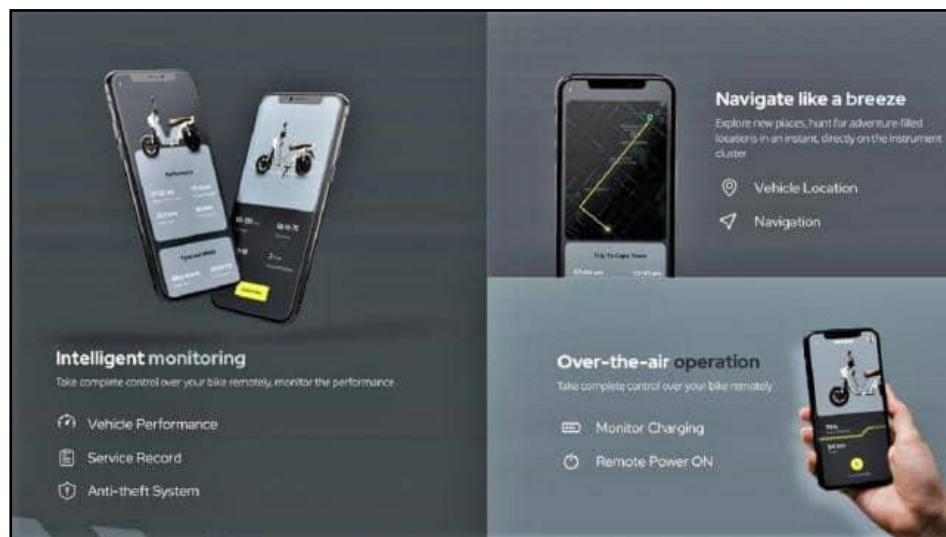
The company claims to offer the warranty for 7 years on chassis. They give overall warranty for 3 years. This overall warranty includes 20,000 km standard for vehicle, battery, charger, and equipment. They also give a chance for getting extended warranty also. This bike includes the 12 built in smart sensors.

Company words :

They say that “Rugged” is built up by using the collected data of EbikeGo’s AI (Artificial Intelligence) by the management system. Their bike delivery would begin from November of this year 2021. The scooter booking can be done by the company’s official website, with a cost of Rs. 499, and is refundable in case of cancellation.



This will further develop in 9 states in the upcoming months with about 3000+ charging plants. Soon after, this will be available in all areas both in online and offline stores





KUMARAGURU
college of technology

COIMBATORE – 641 049

Department of Mechanical Engineering

INSTITUTE VISION:

The vision of the college is to become a technical university of International Standards through continuous improvement.

INSTITUTE MISSION:

Kumaraguru College of Technology (KCT) is committed to providing quality Education and Training in Engineering and Technology to prepare students for life and work equipping them to contribute to the technological, economic, and social development of India. The College pursues excellence in providing training to develop a sense of professional responsibility, social and cultural awareness and set students on the path to leadership.

DEPARTMENT VISION:

To emerge as a centre, that imparts quality higher education through the programme in the field of Mechanical Engineering and to meet the changing needs of the society.

DEPARTMENT MISSION:

The department involves in sustained curricular and co-curricular activities with competent faculty through teaching and research that generates technically capable Mechanical Engineering professionals to serve the society with delight and gratification.

B. E. MECHANICAL ENGINEERING

PROGRAM EDUCATIONAL OUTCOMES (PEO's):

- PEO 1 :** Graduates will take up career in manufacturing and design related disciplines.
- PEO 2 :** Graduates will be involved in the execution of Mechanical Engineering projects.
- PEO 3 :** Graduates will take up educational programme in mastering Mechanical sciences and management studies.

PROGRAM OUTCOMES (PO's):

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
6. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
7. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
8. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
9. **Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSO's):

1. Apply the fundamentals of science and mathematics to solve complex problems in the field of design and thermal sciences.
2. Apply the concepts of production planning and industrial engineering techniques in the field of manufacturing engineering.

M. E. INDUSTRIAL ENGINEERING

PROGRAM EDUCATIONAL OBJECTIVES (PEO's):

- PEO 1 :** Graduates will be mid to higher level management / engineering professionals with responsibilities in engineering management, data analysis and business operations.
- PEO 2 :** Graduates will be engineering professionals, and technology leaders who would manage such functions as plant engineering, production, supply chain and quality management.
- PEO3 :** Graduates would function as educators or researchers in academic institutions.

PROGRAM OUTCOMES (PO's):

- P01** : An ability to independently carry out research /investigation and development work to solve practical problems.
- P02** : An ability to write and present a substantial technical report/document.
- P03** : Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.

PROGRAM SPECIFIC OUTCOMES (PSO's):

- PS01** : Graduates able to apply the engineering management and data management concepts in industrial engineering areas.
- PS02** : Graduates able to apply industrial engineering skills and knowledge to manage the functions of production and supply chain management.

M. E. CAD/CAM**PROGRAM EDUCATIONAL OBJECTIVES (PEO's):**

- PE01** : Graduates excel in Professional career and/or higher education or/ research by continuously updating the knowledge and skill in the fields of Computer Aided Design and Manufacturing.
- PE02** : Graduates can analyze the complex problems using advanced modelling and analysis tools and thereby solve problems related to product design and manufacturing area.
- PE03** : Graduates work individually and in a team with effective communication skills and pursue lifelong learning.

PROGRAM OUTCOMES (PO's):

- P01** : An ability to independently carry out research /investigation and development work to solve practical problems.
- P02** : An ability to write and present a substantial technical report/document.
- P03** : Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program

PROGRAM SPECIFIC OUTCOMES (PSO's):

- PS01** : Graduates will be able to apply the knowledge and skill in solving the real-time problems in the Computer Aided Design and Manufacturing field.
- PS02** : Graduates will be able to analyse complex problems and provide solutions using advanced tools in product design and manufacturing area.