KUMARAGURU
COLLEGE OF TECHNOLOGY

Department of Mechanical Engineering

Newsletter
MExpress

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Dr. B. N. Sreeharan

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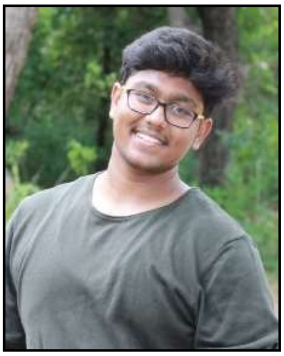
Mr. Nitheeshwar R K
Mr. Praveen B
Ms. Rushethra P N

Associate Editor's Folio

A NON-PETROHOLIC BIKE?!!!



Mr. Nitheeshwar R K
19BME067
II Year Mech - B

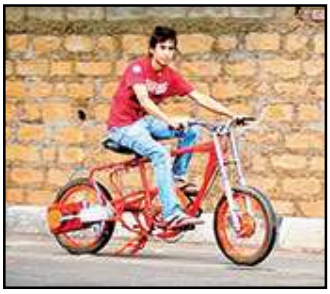
A bike that doesn't need any fuel? Clocks 82kmph?!!!

Affirmative, it's a hydraulic powered bike, 'Mutated Bicycle' clocks 82kmph smooth ride.

You don't mind planting your feet firmly on the pedal, here comes a bike that slakes your desideratum for celerity, boasts a look inspired by American cruisers, runs on zero fuel and doesn't puff out any smoke.

Santosh Kumar Gupta, a techie from Hazaribagh, has designed and patented what he calls the "mutated bicycle" — an advanced version of the humble two-wheeler aimed for youngsters and professionals who dote a swift ride without integrating to pollution.

The incipient generation green "bike" is different, as there is no desideratum to pour fuel or charge any battery, verbally expressed the inventor, who works for a Bangalore-predicated photocopy company. "The chain of the conventional bicycle has been superseded with a hydraulic coil. This bicycle has three gears, which sanction the rider to physically contact high speeds without pedalling much".



The bicycle, which lacks a chain, transfers manual power to the rear axle of the wheel by betokens of the hydraulic drive or cylinder. The design of the mutated bicycle — denominated so "because it was technically and structurally altered" — is a quaint throwback to the cruiser bikes propagated by the relishes of Harley Davidson.

Santosh integrated that one could even coast uphill with minimal effort on his bicycle. "Besides being environmental-cordial and low-maintenance, it can work up a celerity of 82km per hour if one pedals at the rate of 40 revolutions minutely, thanks to its hydraulic coil and air pressure mechanism," he promised. The hydraulic system takes care of shaky terrain with few jerks, verbalized the 25-year-old, integrating that the bicycle would withal minimize strain on knees. "It makes low noise even on deplorable roads and has height-adjustable seat to suit all age groups," pointed out Santosh, who spent Rs 35,000 on developing his model. It was his dream since his days as a student of DAV Public School, Hazaribagh, to develop "a bike without engine and zero fuel consumption".

After pursuing intermediate in 2006, Santosh joined JSS Academy of Technical Edification, Bangalore, as mechanical engineering student. On December 23, 2010, he decided to work on his dream bicycle project. "After four months of research and strenuous exertion. I made my first model and denominated it mutated bicycle." He was dissatisfied with two successive endeavors, with the models drawing reproval from his peers. In July 2011 as he graduated, Santosh decided against taking up a job so that he could consummate his dream project. "I redesigned the bike this April and determinately my invention was yare in the first week of October," Santosh verbally expressed. He withal obtained a patent for his innovation in April this year.

Now, he is alacritous to verbalize with fascinated companies to commence mass engenderment of the cycle and bring its cost down to Rs 30,000.

Departmental Activities

Programmes Organized

On behalf of Mechanical Engineering Association following programmes were organized virtually.

- Event on Junior Mech Master – 18-02-2021
- Webinar on Research Scope Opportunities for Mechanical Engineers in INDIA – 14-02-2021
- Aptitude Stand a Chance – 16-02-2021

Dr. V R Muruganantham, ASP and **Mr. M A Vinayagamoorthi**, AP (II) coordinated the event.

Faculty as Resource Persons

Mr. M. A. Vinayagamoorthi, AP (II) being the resource person delivered a guest lecture on " Geometric Dimensioning and Tolerancing" organised by Sri Krishna College of Technology, Coimbatoreo n 05-02-2021.

Dr. P. S. Samuel Ratna Kumar, AP acted as external DC member at Karunya University on 24-02-2021.

Dr. V. R. Muruganantham, ASP acted as external examiner for the Projects at GCT, Coimbatore on 19-02-2021. He also acted as external examiner for the lab practical conducted on 23-02-2021.

Dr. P. R. Ayyappan, AP (SRG) acted as external examiner for the lab practical at GCT on 15-02-2021, 16-02-2021 and on 25-02-2021.

Dr. S. Bhaskar, ASP handled a three-hour online session on 20.02.2021 on “Basic approach of Outcome Based Education for Outcome Based Accreditation” and “Taxonomy for knowledge skills and attitude in outcome-based education” during the 4th Online Faculty Induction Programme (Guru-Dakshta) (25-01-2021 to 25-02-2021) organised by UGC – Human Resource Development Centre (UGC-HRDC) Sardar Patel University Mota Bazar, Opp. SICART, Vallabh Vidyanagar-388 120, Gujarat 02-02-2021. He also was the resource person for a online Session (One hour) on “Profile Building” – Organised for PG students of KCT by PG FORUM – KCT on 03-02-2021 and “Career Related Q & A Session” and Crack Your Hurdles – Organised for ECE students of KCT by ECE Association – KCT on 23-02-2021 and 26-02-2021

Departmental Activities

Dr. V. Muthukumaran, Professor was the Resource person for a AICTE sponsored one week online short-term training program on “Innovation in Materials and Industrial Automation (Phase-III) February 15-20, 2021" on 16-02-2021.

Papers Submitted

Dr. S. Balasubramanian, ASP submitted a paper a Scopus indexed journal.

Papers Reviewed

Dr. C. Velmurugan, Professor and HoD reviewed a paper titled “Development of self compacting concrete using bailey aggregate grading technique in comparison with Indian standard code of practice” for the International Journal of Engineering Design and Technology.

Dr. P. S. Samuel Ratna Kumar, Assistant Professor reviewed the following papers in the respective WoS / Scopus indexed journals as mentioned thereof.

- Study on Optical Properties and Biological Activity of Proanthocyanidins at Different pH and Alkalinit - IOP Publishing
- Structural and optical properties of pristine and doped CsPbBr3 perovskite - IOP Publishing
- Self-lubricating Property of Cu2S Composite Films on Ni60+60%WC Cermet - IOP Publishing
- "A study on the influence of ageing heat treatment on hardness and electrochemical corrosion behavior of AZ91D - 5SiC - 1Gr hybrid magnesium metal matrix composite" - Silicon
- Experimental Investigation of Natural Convection Heat Transfer Coefficient for Roughed Inclined Plate - Materials Today.

Dr. P. R. Ayyappan, AP (SRG), reviewed a paper titled “Influence of oxygenated fuel pursuance in diesel engine combustion and emission characteristics for the International Journal Science of the Total Environment.

Dr. S. Thirumurugaveerakumar, ASP, reviewed a paper titled “Response of submergence rice growth and yield grown in calcareous soil to foliar application of NPK Journal of Environment and Waste Management.

Departmental Activities

Book Chapter Publications

Mr. R. S. Mohan Kumar, AP published a book chapter as detailed Recent Developments in Engineering research, vol.11 in A Detailed Study on Design and Fabrication of an Efficient Handling Water Weed Removing Machine, Book Publisher International, Third Floor, 207 Regent Street, London, W1B 3HH, UK, Fax: +44 20-3031-1430 124-130Print ISBN: 978-93-90768-86-8, eBook ISBN: 978-93-90768-87-6.

Dr. S. Balasubramanian, ASP published a book chapter as detailed "Research and Finding Technical Enablers using Ism for Industry 4.0 in Indian Agricultural Industries, Book Publisher International, Third Floor, 207 Regent Street, London, W1B 3HH, UK, Fax: +44 20-3031-1429 Registration Number: L77527.

Dr. V. Muthukumaran, Professor published a book chapter New Ideas Concerning Science and Technology Vol. 8, A Detailed Experimental Research on the Water Repellency Property of Beeswax Treated and Bacterial Cellulosic Material, Book Publisher International, Third Floor, 207 Regent Street, London, W1B 3HH, UK, Fax: +44 20-3031-1429, 145-151, Print ISBN: 978-93-90768-86-8, eBook ISBN: 978-93-90768-87-5.

Doctoral Committee Meetings

Dr. C. Velmurugan, Professor & HoD organized first doctoral committee meetings for his research scholars, Mr. R. Arun Kumar and Mr. Binnu Kurian Mathew on 11-02-2021 and 26-02-2021 respectively.

Awards Applied

Mr. P. D. Devan, AP applied for the award “Dr. A.P.J. Abdul Kalam Teacher's Excellence Award 2020” under Shikshak kalyan (NGO).

Online Courses / Programmes attended / participated / completed

Dr. V. R. Muruganantham, ASP participated in a 2 weeks FDP on Entrepreneurship from 01-02-2021 to 13-02-2021.

Departmental Activities

Dr. B. N. Sreeharan, AP (II) participated in a FDP on Application of Research Methods and Statistical Tools in Management Studies and Social Sciences from 08-02-2021 to 13-02-2021. He also participated in a Guest Lecture on Technology in Autonomous Vehicles: Current Trends & Future on 16-02-2021 and in a Webinar on Art of writing research articles on 20-02-2021. He also completed a Couresera online course on Linear Regression for business on 08-02-2021.

Dr. P. R. Ayyappan, AP SRG participated in an ATAL FDP on 3D printing and design from 01-02-2021 to 05-02-2021.

Mr. K. Manikanda Prasath, AP completed a Coursera Course on Financial Modeling from 05-02-2021 to 25-02-2021.

Dr. N. Sangeetha, ASP completed a Couresera online course on AI for Everyone on 01-02-2021 and she also participated in a Training on LS DYNA from 03-02-2021 to 05-02-2021.

Dr. M. Balaji, ASP registered for a NPTEL course on Principles of IE from 01-02-2021.

Dr. K. Ulaganathan, AP III participated in an ATAL FDP on Energy Engineering from 08-02-2021 to 12-02-2021.

Mr. M. Thirumalaimuthukumaran, AP III participated in an ATAL FDP on 3D printing and design from 15-02-2021 to 19-02-2021 and in a Webinar on How to Become a Successful Researcher At Every Stage of Your Career on 18-02-2021 along with Webinars on Best Practices in Submitting Research for Highly Selective. Essential tips for publishing in high-impact journals Must Know Tips for Publishing in Premium Journals.

Mr. S. Prabhu, AP participated in a training on LS DYNA from 03-02-2021 to 05-02-2021.

Departmental Activities

Dr. K. K. Arun, AP III participated in an ATAL FDP on Hybrid Machining Solutions for Typical/Complex Engineering Applications from 01-02-2021 to 05-02-2021 also he completed Couresera courses on Supply chain management: Be global! And on Introduction to Psychology!

Dr. S. Slvakumar, AP III participated in a training on LS DYNA from 03-02-2021 to 05-02-2021 and also he participated in an FDP on Renewable Energy Sources and Future Energy Needs" organized by Department of Mechanical Engineering, Madhav Institute of Technology & Science, Gwalior sponsored by TEQIP III, in collaboration with Twinning Partner Delhi Technological University, Delhi from 15-02-2021 to 19-02-2021"

Mr. M. A. Vinayagamoorthi, AP II participated in a Web Seminar on Total Quality Management organized by National Productivity Council, India on 27-02-2021 and webinars on Necessary Tool for Achieving Productivity and Right diet for Better Productivity organized by CPC - Productivity Week Celebrations on 12-02-2021 and 13-02-2021 respectively, organized by CPC - Productivity Week Celebrations. And Faculty Webinar Series - Webinar # 24: Active learning Methodological Online Tools for Teaching on 12-02-2021.

Dr. S. Balasubramanian, ASP participated in a Webinar on Faculty Webinar Series - Webinar # 22 : Online active learning tools on 10-02-2021.

Mr. T. Karuppusamy, AP II participated in a Webinar on Necessary Tool for Achieving Productivity and Right diet for Better Productivity organized by CPC - Productivity Week Celebrations on 12-02-2021 and 13-02-2021 respectively, organized by CPC - Productivity Week Celebrations.

Mr. S. Sivakumar, AP II participated in a Webinar on Faculty Webinar Series - Webinar # 24 : Active learning Methodological Online Tools for Teaching on 12-02-2021 and he also participated in a Guest Lecture on Technology in Autonomous Vehicles: Current Trends & Future on 16-02-2021.

Departmental Activities

Internships Arranged

Dr. N. Sangeetha, ASP (SRG) arranged internships to the following students at M/s. Salem Steel Plant, Salem from 23-02-2021 to 02.03.2021

18BME127	Mr. M. Prasanna Venkatesh	18BME094	Ms. S. Karthikeyan
18BME112	Mr. P. Praveen Kumar	18BME117	Mr. M. A. Mugesh
18BME064	Ms. P. Madhumitta	18BME118	Mr. P. S. Saran.
18BME068	Ms. V. Nandhini		

Dr. V. R. Muruganantham, ASP arranged internships to the following student at M/s. VLR Fabricators from 12-02-2021 to 19-02-2021.

17BME215	Mr. A. Nihal	17BME225	Mr. K. Pavithran

Mr. P. D. Devan, AP arranged the internships in the above company for the following students

17BME221	Mr. M. Harish	17BME232	Mr. S. Bharathi
17BME234	Mr. V. Vijay		

Dr. S. Balasubramanian, ASP arranged internships for the following students at M/s. Southern Heat Exchanger from 11-02-2021 to 19-02-2021.

18BME220	Mr. R. Arishwaran	18BME001	Mr. K. Pravin
18BME098	Mr. S. Harishmaran	18BME168	Mr. V. Rahul

Mr. R. S. Mohankumar, AP arranged internships for the following students at M/s. Samudhra Pumps from 01-02-2021 to 28-02-2021

17BME202	Mr. S. Dharankumar	17BME223	Mr. B. Kumaran

Dr. V. R. Muruganantham, ASP and **Mr. P. D. Devan** taken initiative to arrange training cum placement in M/s. AVTEC, Chennai for 7 students of the department.

Departmental Activities

Dr. C. Velmurugan, Professor & HoD, arranged internships for the following 7 students at M/s. Sakthi Gear Products, Coimbatore from 16-02-2021 to 26-02-2021.

Mr. D. P. Nirmalkumar, Mr. M. Yaswanth Raghav, Mr. R. Ravi Ragul, Mr. H. N. Lalith, Mr. R. Mohan, Mr. K. Praveen, Mr. S. Devaiyanayagam

Industry Linkages

The Ford India Private Limited sponsored one ECOSPORT Vehicle to our Institute under Corporate Social responsibilities Initiative Scheme for learning purpose. It will be used for demonstration to impart training to our students. Our institution taken care of the vehicle shipment, logistics charges from Ford India (Chennai – Maraimalai Nagar) to our institution. The vehicle is stalled in Lathe Shop.

Entire process was coordinated by **Dr. A. P. Arun**, AP (II).

Mechanical Engineering Association Activities

SKILL DEVELOPMENT COURSE '21

Skill Development Course - 2021, is an initiative by Mechanical Engineering Association for the emerging/budding young engineers to explore and aspire technical skills during their 1st year. SDC'21 is a series of events that has been planned and happened from 8th to 14th February 2021, for the 1st year Mechanical Engineering Students of KCT with leading Technical Forums. In this Program we have provided with 4 courses and 3 workshops, that was handled by various students and faculty experts from the technical forums of KCT to the 96 students from 1st year of Mechanical Engineering and co-ordinated by Mr. Praveen B, Mr. Nitheeswar R K, Mr. Aswin Baalaje R.

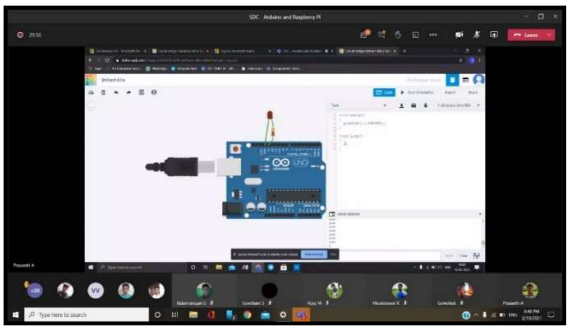
COURSES OFFERED:

1. Arduino and Raspberry Pi by IQube,
2. Autonomous Vehicle by KC.IRI. and Introduction to RC
3. Smart Automotive Design Concept by Garage.

WORKSHOPS OFFERED:

1. Product design and development workshop by Forge
2. Paper writing and patent filing workshop by Ré.
3. Research Scope opportunities of Mechanical Engineers in India by DRDO.

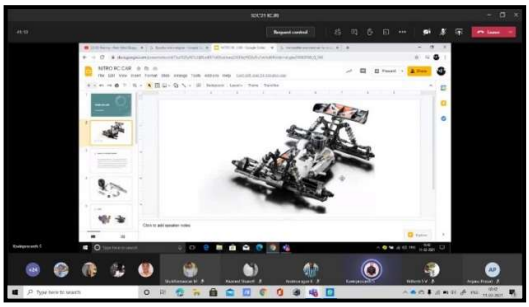
Arduino and Raspberry Pi:

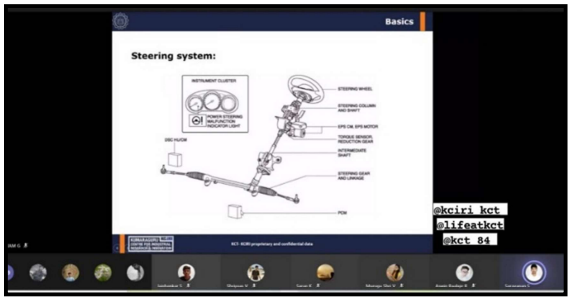


Arduino and Raspberry Pi is one of the courses offered in Skill Development Course'21 by IQube, one of the leading technical forums in KCT. This course was offered to 31 students and co-ordinated by Mr. Praveen B. This Course was handled by Mr. Praveen Kumar S from 3rd year ECE, Mr. Prasanth A from 3rd year ECE and Mr. Dinesh Kumar D from 3rd year ECE for the period of 5 days.

Mechanical Engineering Association Activities

Autonomous Vehicle by KC.IRI. and Introduction to RC:





Autonomous Vehicle by KC.IRI is one of the courses offered in Skill Development Course'21 by KC.IRI, one of the leading technical forums in KCT.This course was offered to 32 students and co-ordinated by Mr. Aswin Baalaje R. This Course was handled by Mr. Sai Ganesh J, Project Manager at KC.IRI, Mr. Saravanan S, Research Assistant at KC.IRI and Mr. Ramesh Selvakumar, Senior Project Engineer at KC.IRI for the period of 3 days. Introduction to RC is one of the courses offered in Skill Development Course'21 by Mr. Kavinprasanth S, 4th year Mechanical Department.

Smart Automotive Design Concept:

Smart Automotive Design Concept is one of the courses offered in Skill Development Course'21 by Garage, one of the leading technical forums in KCT.This course was offered to 33 students and co-ordinated by Mr. Nitheeswar R K. This Course was handled by Mr. Kiranlal S, Assistant Professor-I at KCT-Garage, Mr. Athi Srinivasan A N, Executive at KCT-Garage, Mr. Vishnu V,4th year Automobile department, Mr. Muhsinul Islam, 4th year Automobile department, Mr. Hariharasudhan A B, Alumni- Automobile department.

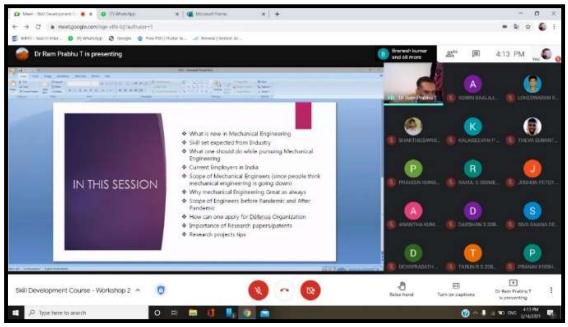
Paper writing and patent filing workshop:

Paper writing and patent filing workshop is the workshop offered in Skill Development Course'21 by Ré, one of the leading technical forums in KCT. This session was handled by Ms. Lokitha T, Executive- Ré and offered to all of the students who have registered for SDC'21. This session gave the brief description about, how the research paper should be written and importance of publishing Research paper.

Mechanical Engineering Association Activities

Research Scope opportunities of Mechanical Engineers in India:

Research Scope opportunities of Mechanical Engineers in India is the workshop offered in Skill Development Course'21 by DRDO. This session was handled by **Dr. Ram Prabhu T**, Research scientist at National Aerospace Laboratories and offered to all of the students who have registered for SDC'21.



Aptitude Stand A Chance

Aptitudes stand a Chance is an event organized by MEA for the sake of clearing the preliminary round during Placements. The Pre-Final years are the most targeted in this event. This event made the students to get started with aptitudes regularly, solve brain teasers and puzzles, that helped improve their logical skills.

They started to practice different kinds of problems again and again to master them. In this event they were ready to assess diverse areas such as problem solving, logic, technical and linguistic capacity also Explore and develop their aptitude solving skills to score better in every competitive exam or placements, they target.

This event was conducted on 16th February 2021. Syllabus has been framed and questions are selected for the test only on Qualitative Reasoning. Topics includes Blood Relation, Analogy, Seating Arrangements, Sequences.

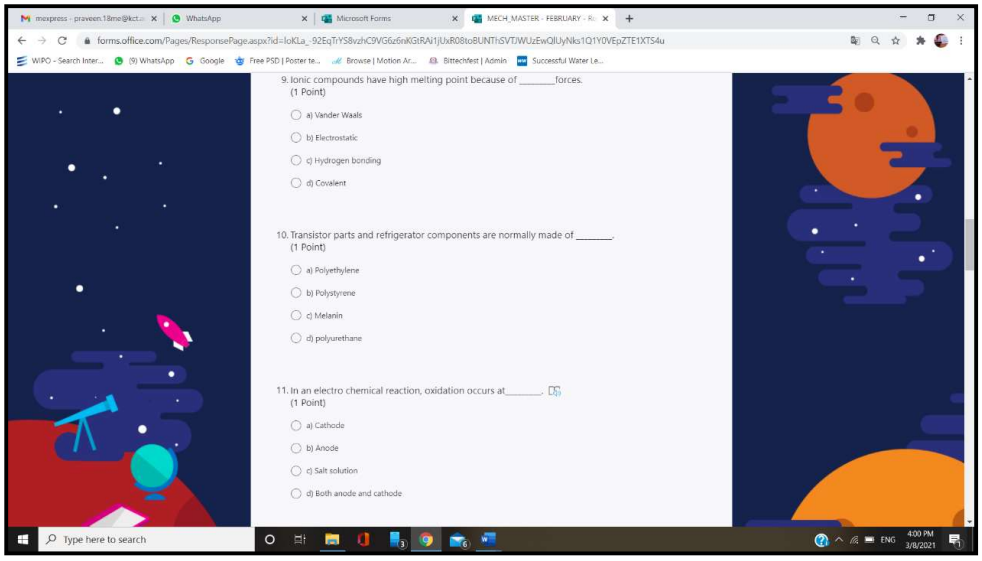
This test comprises of 30 questions for which 4 marks are awarded for each correct answer and for each wrong answers the score is reduced by 1.

This event was conducted successfully under the guidance of Dr. V R Muruganantham and Mr. M. A Vinayagamoorthi, Faculty Coordinator, MEA coordinated by Mr. Joshua Peter and the volunteers were, Mr. Jayabalu - 19BME219, Mr. Hema Vijay B - 19BME025.

More than 96 students participated in this event in that Mr. Sudarshan K – 19BME099 was the winner, followed by him Mr. Deepan Issac T - 18BME050 was the runner.

Mechanical Engineering Association Activities

Junior Mech Master:



Junior Mech Master is an event exclusively for first year students in which you can test your skills on various specialization of Mechanical Engineering by challenging yourself with competitive MCQs. This will be an opportunity for technical aspirants those who are preparing for GATE, IES and other related exams. It was held on 18th February 2021. This event focused on appraising the student's knowledge on the grounds of Engineering Chemistry and Engineering Mathematics.

Twenty-Four Students participated from which Nine of them were selected for the second round which was chiefly based on Engineering Chemistry & Engineering mathematics and its applications.

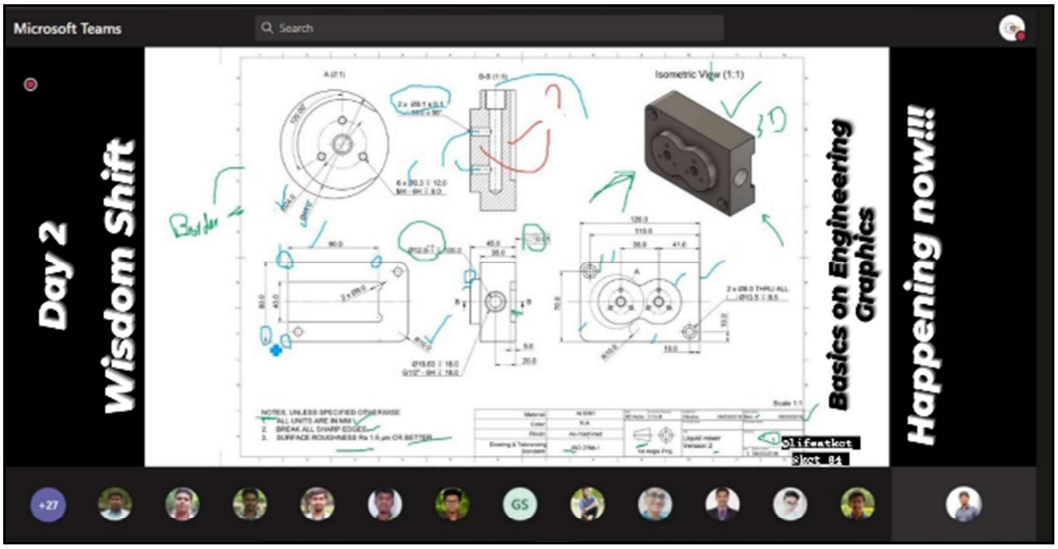
Mr. Nandeesh M - 20BME076 bagged the first place and followed by Mr. Rahil S - 19BME089 was the runner-up of this event.

The MEA event coordinator was Mr. Suvanraj R - 19BME100 & Mr. Padrinarayanan - 19BME010.

Wisdom Swift

Wisdom Shift is one of the platforms in ME - COMMUNITY where we will provide both technical & non-technical sessions, value added courses etc, to the students which helps in the enhancement of their engineering career. Alumni talk and guidance sessions is also conducted to make all the participants to ensure that they are at the right path of preparation to meet the expectation of the industries at present. The vision of the Wisdom Shift is to produce future ready Engineers to sustain in the competitive world. And the mission is to provide co-scholastic training and technical skills through student centric and guided learning to meet the changing needs of the society.

Mechanical Engineering Association Activities



Technical Sessions

- Engineering Mechanics
- Engineering Graphics
- Geometric Dimensioning & Tolerances
- Engineering Thermodynamics
- Strength of Materials
- Materials Science and Metallurgy
- Quality control and Meteorology
- Product Design and Development

Non-Technical Sessions

- Resume Writing
- Email Writing
- Microsoft Excel
- Importance of Design Software
- Career Guidance
- Personality Development

Other than these technical and Non- Technical sessions the students are also made to develop the soft skills like mention below.

- Communication
- Leadership
- Team Work
- Critical Thinking
- Time Management
- Problem Solving
- Creativity

The coordinators of Wisdom Swift are Mr. Deepan Issac T, Mr. Srivathsan V & Ms. Nandhini V. Through the Wisdom Shift platform 40 students from 3rd year and 20 students from 2nd year will be given extensive training for 4 months. These students were selected based on their SOPs. Three weeks have successfully completed, Engineering Graphics & Engineering Mechanics were covered by Mr. Devan & Dr. Ulaganathan professors of KCT Mechanical respectively

Student Activities

- **Mr. Mahesh Kumar. U** -18BME122 of 3rd year mechanical has successfully patented his design on buckle for wristwatch on the month of February. Every wristwatch is worn little bit tightly or loosely on the wrist of the user. This is due to the pre-defined holes on the strap. The buckle that he has designed will make the user to wear the watch fit to the wrist. This buckle is simple in design and effective in application.

- **Mr. Kavipriyan L** - 18BME056 attended the workshop on 'THE ART OF MOTORBIKE MANUFACTURING AND THE DAWN OF PNEUMATIC BIKES' on 22/02/2021 organised by Coimbatore Institute of Technology.

- **Mr. Praveen B** -18BME092 of 3rd year mechanical engineering participated in college quiz competition 'Udyog Mantham for Productivity' on 12/02/2021 to 17/02/2021 secured 2nd place conducted by Coimbatore productivity council.

- **Mr. Praveen B - 18BME092, Mr. Prasanth M - 18BME100 & Mr. Krishnaprasad L - 18BME105** of 3rd year mechanical engineering participated together a team in the National level competition 'Bridge Design Contest' on 25/02/2021 conducted by Shaastra IIT Madras.

- **Mr. Praveen B - 18BME092, Mr. Prasanth M - 18BME100 & Mr. Krishnaprasad L -18BME105** of 3rd year mechanical engineering attended the National level physics quiz on 12/02/2021 to 17/02/2021 conducted by Shaastra IIT Madras and secured 5th, 23rd and 30th Position respectively.

- **Mr. Praveen B -18BME092, Mr. Prasanth M - 18BME100 & Mr. Krishnaprasad L -18BME105** of 3rd year mechanical engineering participated together a team in the National level competition 'Smart water challenge' on 24/02/2021 to 28/02/2021 conducted by Shaastra IIT Madras and backed the 3rd Position.


- **Mr. Nandeesh M** - 20BME076 took part in a national level event 'SAARANG' held on 16/02/2021 organised by IIT Madras.

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Student Activities

- **Mr. A. V. CHARANKUMAR** - 18BME140 of 3rd year mechanical engineering attended NCC CAMP 25/02/2021 to 28/02/2021 organised by 2 (TN) AIR SQN NCC at Coimbatore government college. **He also** attended Combined annual training camp 25/02/2021 to 28/02/2021 organised by NCC, Government arts college, Coimbatore.

- **Mr. M. Boopathi Karthik** - 18BME202 of 3rd year mechanical engineering participated in the competition 'CNC COADER 'held on 27/02/2021 to 28/02/2021 organised by Coimbatore Institute of Technology.

- **Mr. Jayabalu** - 19BME219 of 2nd year mechanical engineering participated in the competition 'Tune into road safety" held on 12/02/2021 to 15/02/2021 organised by KCT Yuir club and in the competition "Escape Overthinking" held on 12/02/2021 to 18/02/2021 organised by KCLAS.

- **Mr. Akash Velanganni D** - 20BME008 of 1st year mechanical engineering participated in the competition "Invent Art" held on 18/02/2021 to 22/02/2021 organised by KCT Varnam club.

- **Ms. Anjana Prasad**- 20BME01 attended the webinar on 'IPR and patent filling process' on 16/02/2021 organised by IPR cell KCT.

DNA OF STARTER MECHANISM

History of Starter mechanism:

Early automobiles used manual hand cranks to start the engine of their vehicle which was very tough and dangerous to human operators. Various other automakers started using spring – powered starters to Gun powders to start their engine. Human – powered "starter motor" needed a lot of effort by turning the handle at some high speed to start the engine.

Mr. Manav R Samant
19BME006
II Year Mech. - A

Early engine starting mechanisms:

The internal combustion engine used in vehicles of modern days had lacked the ability to self-start which was one of the very biggest drawbacks at that time. That time, the automakers started using these different starting techniques.

- Hand crank starters
- Spring – powered starters
- Gun powdered starters.

Hand Crank Starters:

Hand crank starters for the internal combustion engine was the most common technique to start the engine of the vehicles. There was a crank handle at the front of the car that would be attached with the crankshaft of the engine. To begin the process of internal combustion engine, the operator had to turn the crank handle that would literally crank the engine. The hand crank starters were so simple and reliable. But it had some handful of drawbacks.

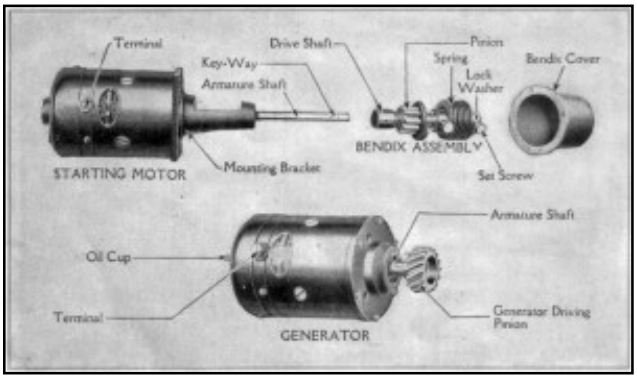
It required some physical effort to turn them. The person who lacked the physical strength to turn them could not use a vehicle equipped with this kind of starter. If the handle continued to turn along the crank after the engine started running, there could be a potential for injury. If an engine kicks back during the cranking process, the operator will be severely injured.

Spring powered starters:

This type of starters was similar to Hand crank starters. In this type of starter, the operator had to charge them through a winding action. The engine used to start using the spring tension instead of directly turning the crank. Spring powered starters fell out of use when the electric starter motors came into the market.

Student Articles

Gun Powder starters:



This type of starter uses a small cordite charge that explodes inside the combustion chamber. This pushes the piston down in the cylinder block which in turn forces the other pistons to move as well. The air-fuel mixture will be ignited and the engine starts to run at its own power.

Introduction to electric starter motors:

The earliest record instances of an electric starter motor was in 1896. An engineer H. J Dowsing installed it on his car. He equipped the dynamotor along the flywheel of the car to start the vehicle's engine. A lot of research had been done to develop the starter motor mechanism.

THE EVERGREEN LURE OF THE AMBASSADOR

Introduction:

The Hindustan Ambassador was an automobile manufactured by Hindustan Motors of India, in production from 1958 to 2014 with few improvements and changes over its production lifetime. The Ambassador was based on the Morris Oxford series III model, first made by Morris Motors Limited at Cowley, Oxford in the United Kingdom from 1956 to 1959.

Mr. Suvanraj R
19BME100
II Year Mech -B

History:

On 11 February 2017, Hindustan Motors executed an agreement with PSA Group for the sale of the Ambassador brand, including the trademarks, for a consideration of ₹80 crore .The tie-up entails two joint-venture agreements between the companies of the two groups. Despite its British origins, the Ambassador was considered as a definitive Indian car and was fondly called the "king of Indian roads". The automobile was manufactured by Hindustan Motors at its Uttarpara plant near Calcutta, West Bengal and at Sriperumbudur near Chennai, Tamil Nadu.

Design and development:

The Ambassador was basically the same Morris Oxford Series - III, launched by Morris, then a part of British Motor Corporation. In 1956 it sold the rights and tooling to Hindustan Motors as it had done for its previous Series - I and Series - II models which were sold by Hindustan Motors as Hindustan 10 and Landmaster. The Series -III model

itself was a derivative of the Morris Oxford Series - II model which was developed prior to the Austin and Morris merger.

The car was quite spacious due to its semi-monocoque design which was quite an advancement in the early 1950s in vehicle engineering. The car was designed by Alec Issigonis whose other famous designs were Mini and Morris Minor.

Production years

The Ambassador remained dominant in the official and company sectors, while also popular as a taxi, but private motorists gradually abandoned the "Amby" in the 1980s and 1990s. Production of Hindustan Ambassador at its plants outside the cities of Kolkata and Chennai ended due to weak demand and financing problems. Prior to the cancellation, the company had sold 2,200 Ambassadors in the financial year which ended in March 2014, only a tenth of the sales the Ambassador reached in the mid-eighties.

Models and generation

- Mark I (1957 to 1962) _First generation
- Mark II (1962 to 1975) _ Second generation
- Mark III (1975 to 1979) _ Third generation
- Mark 4 (1979 to 1990) _ Fourth generation
- Nova _Fifth generation
- Classic _Sixth generation
- Ambassador Grand_ Final generation
- Ambassador Avigo

The Avigo model launched in 2004 was the most radical revision of the venerated Ambassador, a part of a brand revitalisation kicked off in the middle of 2003. The change of name, a break from the Ambassador marque, indicated a different marketing strategy. The Avigo was launched in the summer of 2004. The revitalized line-up consisted of the Ambassador Classic of mid-2003, the Ambassador Grand of late 2003, and the aforementioned Avigo, with the exterior designed by Manvindra Singh. However, the most overpowering influence on the front bonnet has been that of the original Landmaster series (also based on Morris Oxford). The main panels at the rear remained the same but the tail lamp and name plate bezels were redesigned. In interior the Avigo, however, has much more classic-touch internals. The entire dashboard console was redesigned with a classic retro theme reminiscent of the early models with central mounted meter new clusters (like the Mark IV models). Seats were specially built for this model with dual tone beige coloured scheme and wood-grain

interiors. A factory fitted 6CD Kenwood audio system and new air-conditioning system was installed. The car was priced higher than the existing models.

Ambassador Encore

This new model was launched in 2013, to match the BS IV standards of the metropolitan cities with the 1.5-liter diesel. This version was developed with the aid of Austria's Magna Steyr. The new car looks just like an Ambassador Grand and has the same overall dimensions as that of the BS III Ambassadors, although power had climbed to 48 PS (35 kW). The steering wheel was the two-spoke affair first seen in the Nova. In 2013, left-hand drive versions were still built in small numbers for export, to tertiary markets like Nigeria.

MECHANICAL – THE ROYAL BRANCH OF ENGINEERING!

There are 40 different branches of engineering but Mechanical is known as the Royal branch of engineering.

Wanna know why? Let's start!

In this article, I will be sharing the 7 different reasons Why Mechanical Engineering is termed as 'Royal Mechanical Engineering'.

Mr. Kishore Krishna S
19BME013
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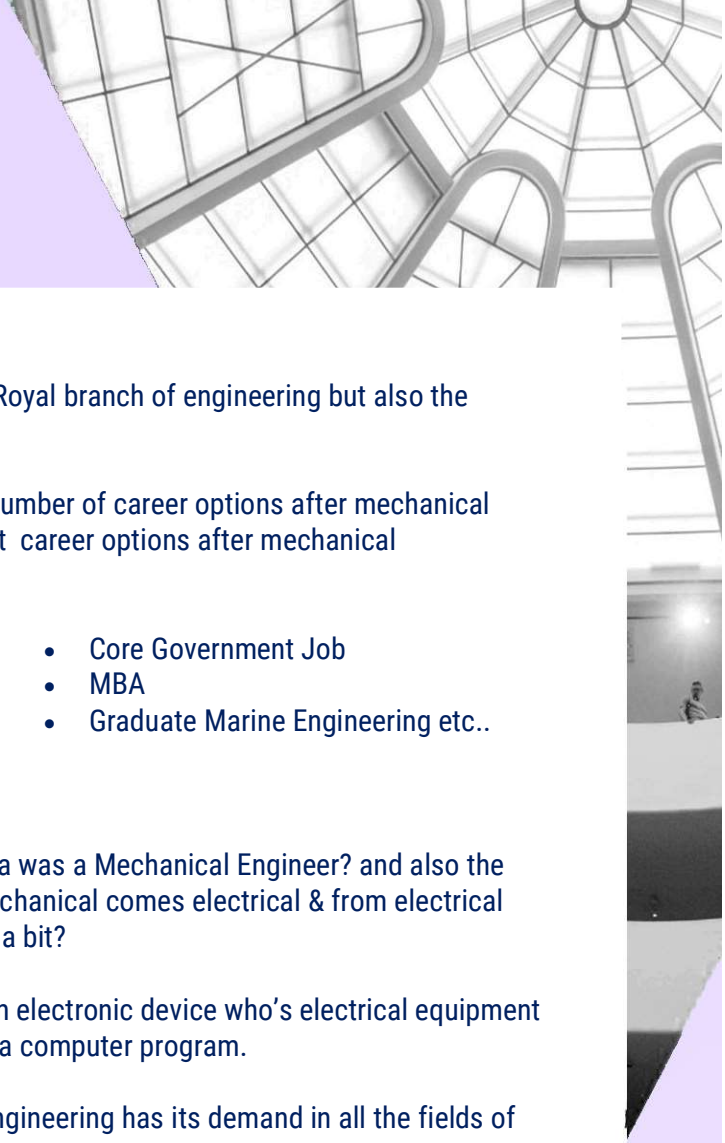
Why Royal Mechanical?

1. Evergreen Mechanical
2. Maximum Sub-Branches
3. Foundation to every other Branch
4. If it's Hardware, it's Mechanical
5. Elon Musk Aero & Auto Oldest after Civil

'A machine is anything that reduces human effort & saves time'. Whether it be a Fan or a calculator or a mobile phone, all of them are machines. In fact, machines surround us. From the pen's nib to the pant's zip, everything is a machine. As a matter of fact, everything with physical appearance falls the under the mechanical department making it the widest branch of engineering.

1. Maximum number of Sub-Branches

According to ASME, there are 37 sub-branches of Mechanical Engineering. This means with one degree you have chances of getting a job in 37 different fields. Mechanical has the highest number of sub-branches as compared to other engineering sub-branches (3 times). This is also one of the reasons behind it being 'Royal Mechanical'.



2. Evergreen Branch

Mechanical Engineering is not only known as the Royal branch of engineering but also the evergreen branch of engineering.

The evergreen term is used because of the huge number of career options after mechanical engineering. To be very precise there are different career options after mechanical engineering.

- MS
- M Design
- Core Private Job
- Core Government Job
- MBA
- Graduate Marine Engineering etc..

3. Foundation to every Engineering Branch

This point is important. Do you know Nicolas Tesla was a Mechanical Engineer? and also the father of Electricity? Well, now you know, from mechanical comes electrical & from electrical comes computer science. Let me explain you this a bit?

Do you have a laptop (If not buy one soon)? It is an electronic device who's electrical equipment are made from mechanical machinery which runs a computer program.

This is also one of the reasons why mechanical engineering has its demand in all the fields of technology.

4. Elon Musk working Hard

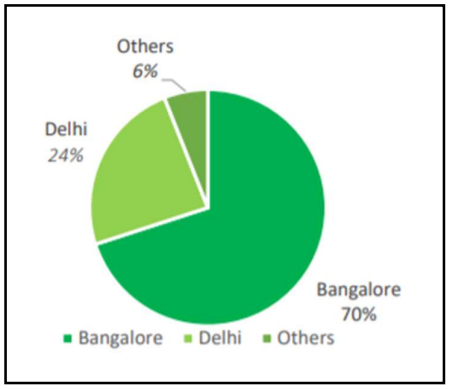
When everyone thought that the era of science has come to an end, Elon Musk came up with three companies.

- Space X: A company that specializes in making cheap and recyclable rockets.
- Tesla Motors: A company that specializes in making electric cars.
- Solar City: A company that specializes in making the renewable source of energy.

All these fields were stagnant due to huge demand in the computer science field. However, now with his improvements & success, we are seeing the rise again.

To summarize, I would like to say mechanical is one of the difficult & the coolest branch of engineering. Difficult because it is not easy to design a space shuttle and Coolest because what is cooler than designing a space shuttle. And all these things combined make Mechanical – Royal Mechanical!

A COUNT ON THE ELECTRIC VEHICLES IN INDIA



Electric Vehicles in India:

- In India, currently electric car market is at a very nascent stage. About 7100 cars on road since introduction of the first Electric Car in 2001 by REVA (Mahindra).

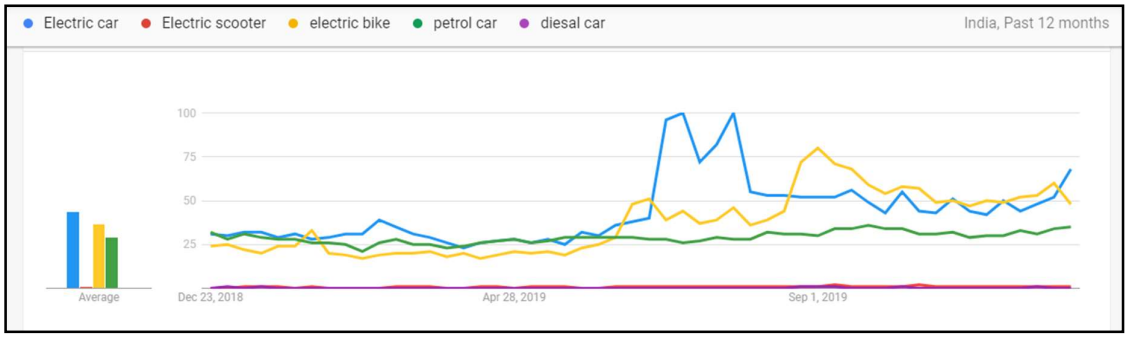
- Mahindra Electric is the first major EV manufacturer in India. Mahindra Electric Mobility Limited, formerly known as the Reva Electric Car Company, is an Indian company based in Bangalore, involved in designing and manufacturing of compact electric vehicles. Mahindra Electric started their journey in to the EV space in 2001 by launching Mahindra Reva, India's first electric car. They subsequently launched Mahindra E20, the current version on roads in India. Later TATA, Hyundai joined in the EV market race.

Mr. Ashwin Baalaje R
19BME069
II Year Mech - B

- In the last few years, there is a rise in interest among the common masses for electric cars in comparison to electric two-wheelers and ICE or petrol/diesel cars, as seen on Google Trends.

Challenges Faced by India in EV Market: Cost:

- One of the main reasons behind buyers not going for an electric car is the high ownership cost. For buyers of EVs, the total cost of ownership (TCO), which includes the cost for acquisition, running, and maintenance, is the most important factor determining the viability of the vehicle.



Charging Infrastructure:

- India was reported to have 650 charging stations in 2018, whereas China had over 456K charging points in the same year. In addition to charging points, the lack of private parking spaces is also a hindrance for electric vehicles adoption.

Range Anxiety:

- Range anxiety is what consumers suffer from knowing that the electric vehicle might not have sufficient range to take them to their destination. This is deeply linked to the lack of charging infrastructure in the country, and while conventional vehicles can be refuelled at petrol stations, such regularised infrastructure is not yet available for EVs.

FAME Policy Flip-Flops:

- The Faster Adoption and Manufacture Of (Hybrid) And Electric Vehicles (FAME) policy has been criticised by the industry in the past. The government had initially focussed on vehicle standardisation with FAME, which was side-lined for an emphasis on manufacturing. At the moment, the government is busy drafting an EV charging infrastructure framework.

VACUUM BRAKING SYSTEM

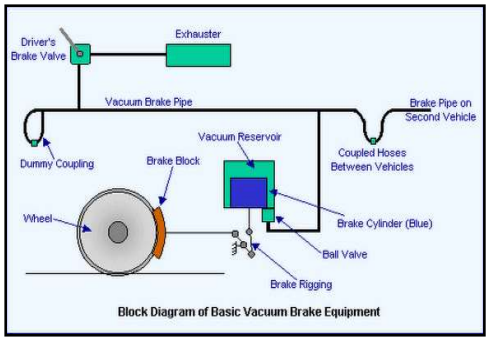
INTRODUCTION:

Nitheesh S V
6405
I Year

There are many types of braking systems, which are being in trend with many new features. Among those, one of the different braking systems that only few of us knew about that is “Vacuum Braking System”. At those days, for stopping or slowing down the railway trains, there is a quite long process, that are first brake must be applied manually and then in vehicle brakes and at last the by Steam power brakes in locomotives. Since each brake is been applied my that member it is really a big and a slow process, and surely it is unsatisfactory, because that person may miss the braking process at times. And this technique, does not even give way for the application of emergency brakes also. In this case, the “Vacuum Braking System” was introduced, which will be explained further.

VACUUM BRAKING SYSTEM:

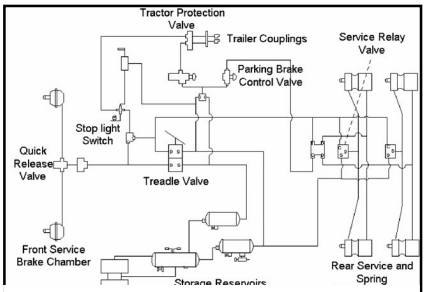
In railways, Vacuum brakes are used instead of Air brakes. The vacuum pump and the brake pipe form the vacuum. The brakes are arranged in such a way that the pressure is taken from the vacuum tank, when the brake is applied. A light duty vehicle has built the Vacuum to assist the Hydraulic Brake System. It is used in the analysis of both light and heavy vehicles. Actually, the vacuum was started in engine and developed in building in the brakes also. It is totally different from Air brake system.



Block Diagram of Basic Vacuum Brake Equipment

WORKING:

Basically, it's working is simple, and it consists of 'Continuous pipes, Train pipe, which will be running throughout the whole train. When the train in normal motion, it maintains a partial vacuum in the train pipe and thus the brakes are released. When it is applied, the air gets inside the pipe, at the atmospheric pressure and it starts to act against the pistons in the cylinders. A part of the vacuum gets accumulated on the other side of the piston and finally the force gets transmitted to the brake shoes thus resulting the application of the brakes on the wheels and the train slows down.



AIR BRAKE WORKING DIAGRAM

DUAL BRAKES:

Dual brakes are those which consists of Vacuum and Air. Here it is amazing to see that, it has the provision space for keeping an additional equipment to be used in case of emergency. That is it has, Vacuum Cylinder and air brake cylinder, which will be operated on same set to apply the brakes evenly. But these dual brakes need a place to be fitted or placed separately at the ends of the trains. If they are not placed or closed properly, then there will be loss of brake, which will be dangerous in stopping the train. The vacuum brakes, the hose is plugged with a stopper, to seal it during suction. But in this case, it is really hard or a difficult task to seal it when compared to the air brakes.

TWIN PIPE SYSTEMS:

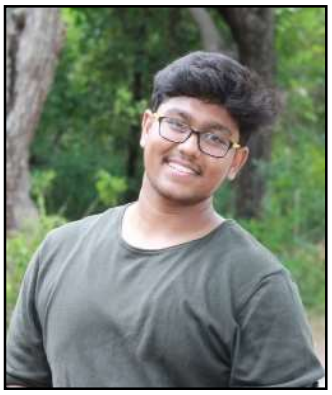
For a speed process of Vacuum braking, it can also be operated using the Twin pipe system also. The reservoirs and the valves were used to increase the speed of brake apply and release. Here, the engine helps mechanically in driving the Vacuum Exhausters, since when the brake is applied, it will be surely running in idling mode only.

CURRENT APPLICATIONS:

At present, every trains have this Vacuum Braking System only. It has developed as the largest operators of trains. There is also Electro Vacuum System, which is been developed further. It uses a 2-inch train pipe and automatic vacuum brake system, which is been controlled electrically for the application of brakes. Actually, this Electric Vacuum Braking system is mostly similar to the Electro Pneumatic Braking system, which is a very big advantage here. Vacuum Brakes are used by the African Railways, Narrow Gauge railways in Europe, a great role in UK, and so on… All main line Heritage trains run using these Vacuum Brakes. But in one case to be noted is, most of the British Narrow Gauge lines use the Air Brakes, because they do not require the continuous braking at that time and it was also difficult for them to fit these Vacuum brakes.

Student Articles

NEW BIRTH OF AVIATION TECHNOLOGY ON INDIAN ROADS



Mr. Nitheeshwar R K
19BME067
II Year Mech -B

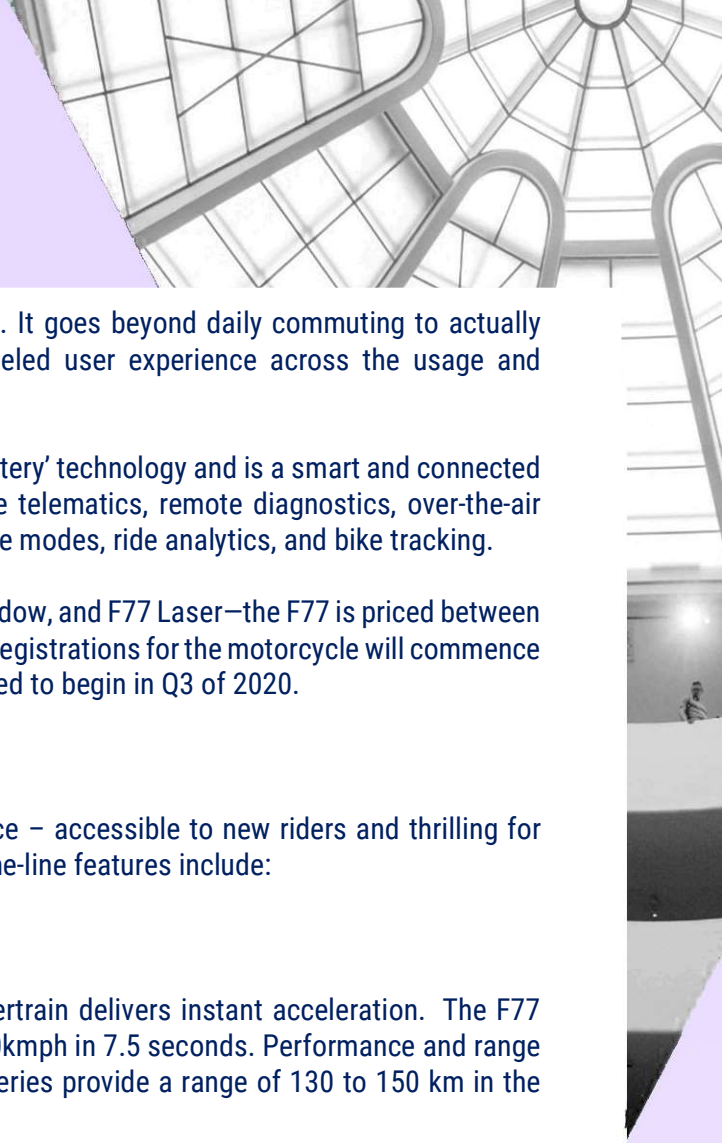
Ultraviolette Automotive, an innovator in sustainable mobility and energy infrastructure, on Wednesday unveiled its highly-anticipated high-performance electric motorcycle – the F77. With an acceleration of 0-60 kmph in 2.9 seconds, top speed of 140 kmph, and a range of 150 km on a single charge, the F77 completely redefines electric mobility in India with its revolutionary design, technology, and user experience. Inspired by designs from aviation and aerospace engineering, the Ultraviolette Automotive F77 has been developed ground up – right from the design identity and the advanced engineering principles observed in design and simulations, to its batteries and multi-level safety systems.

"At Ultraviolette Automotive, we have always believed that, for electric mobility to become mainstream in India, there are two important factors. It is important to build and develop vehicles that are desirable and come with a certain pride of ownership. We need to innovate on the energy side as well. There needs to be good predictability and reliability around usage and replenishment of energy." The genesis of F77 was rooted in these lines of thought. Over the last three years, Ultraviolette has covered an extensive journey of researching, innovating, and developing various prototypes of motorcycles, modular batteries, and chargers. The launch of the F77 is pegged as a testimony to the company's vision of building an entirely new ecosystem of electric mobility in India. Now in its 7th generation, the F77 has undergone several thousand kilometres of testing, and the team is confident that the new offering will be an evocative and compelling alternative to IC-engine motorcycles.

"We also believe that the F77 is the perfect opportunity to further our ambition of building superior and futuristic mobility solutions across India," Narayan said. Propelled by the immediate torque of its 90Nm all-electric powertrain, the F77 is capable of rapid acceleration with just a twist of the throttle, offering the rider a high-performance motorcycling experience. An optimised centre of gravity, a steel-aluminium frame, inverted front forks, and adjustable rear suspension add highly dynamic handling to the experience.

"What excites me about the F77 is the fact that it busts every single negative notion and perception associated with electric vehicles," Niraj Rajmohan, Founder and CTO, Ultraviolette Automotive said.

He added, "It has been designed keeping the aspirations of Indian consumers in mind, while also being tested for the toughest and most extreme terrain and climatic conditions in the country. The F77 is an urban sports/commuter bike that allows both seasoned riders, as well as,



enthusiasts to do more with just one motorcycle. It goes beyond daily commuting to actually deliver high levels of performance and unparalleled user experience across the usage and ownership experience cycles."

The F77 is powered by Ultraviolette's 'Modular Battery' technology and is a smart and connected electric motorcycle that will be enabled with ride telematics, remote diagnostics, over-the-air (OTA) upgrades, regenerative braking, multiple ride modes, ride analytics, and bike tracking.

Available in three variants—F77 Lightning, F77 Shadow, and F77 Laser—the F77 is priced between Rs 3,00,000 and Rs 3,25,000 (on-road). The online registrations for the motorcycle will commence on November 13, 2019, and deliveries are estimated to begin in Q3 of 2020.

The F77 riding experience.

The F77 offers an all-new motorcycling experience – accessible to new riders and thrilling for accomplished motorcyclists. Some of its top-of-the-line features include:

Amazing acceleration:

The instant torque provided by the electric powertrain delivers instant acceleration. The F77 touches 0 to 60 kmph in 2.9 seconds and 0 to 100kmph in 7.5 seconds. Performance and range optimised for the urban rider: The combined batteries provide a range of 130 to 150 km in the city under standard driving conditions.

Regenerative braking:

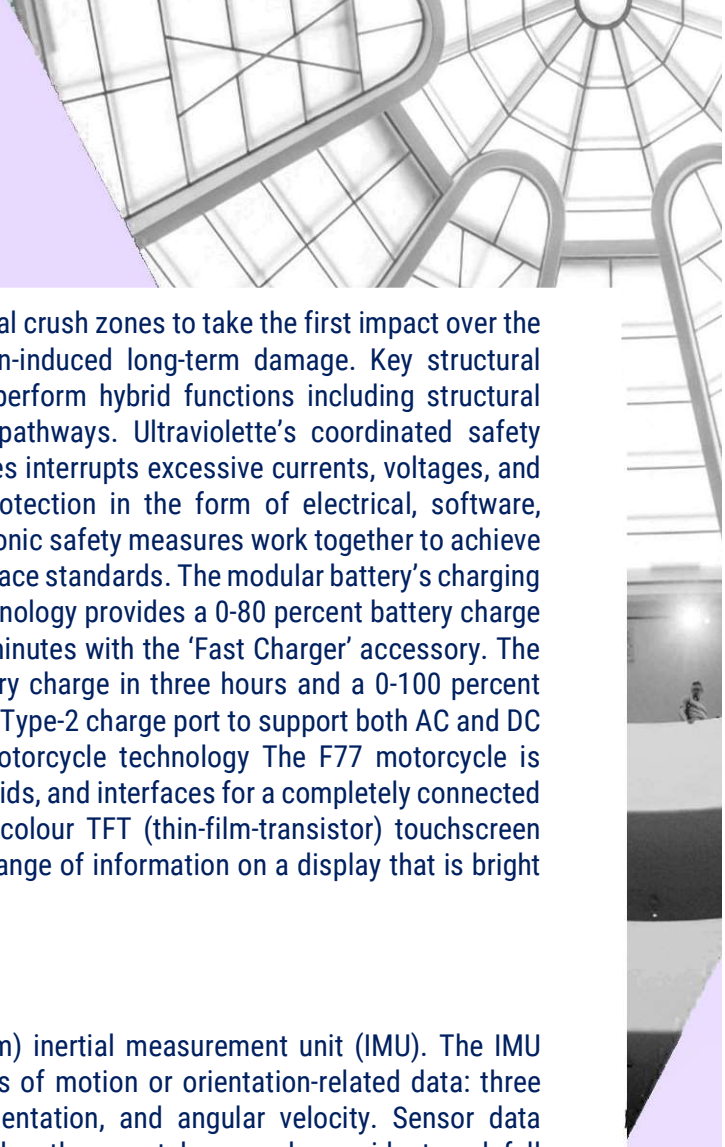
The F77 comes with a customisable power regeneration mode that is activated every time the rider brakes and adds to the battery charge. This is particularly useful in urban traffic that calls for a lot of slow-rolling and stop-and-go riding.

High-performance handling and control:

The F77 is designed to deliver nimble, agile handling for confident control on urban streets and a thrilling ride on curving backroads. The centre of gravity has been optimised to enhance handling, traction, braking, and cornering performance. The lightweight steel-aluminium frame is extremely rigid and contributes to the precise and responsive handling that makes the F77 exciting to ride in any situation.

Modular battery technology

The Ultraviolette F77 is built around a foundational building block of energy storage – modular battery packs. Ultraviolette's modular batteries are built to world-leading standards in terms of power density, energy density, cycle life, and resistance to extreme shock and vibration. Each modular battery incorporates proprietary thermal management technology to radically improve heat dissipation and reduce temperature gradients within cells, leading to a higher cycle life. The



batteries' mechanical protection includes structural crush zones to take the first impact over the cells and structural support to prevent vibration-induced long-term damage. Key structural members within the battery packs are built to perform hybrid functions including structural support and heat dissipation through thermal pathways. Ultraviolette's coordinated safety strategy in place for the battery packs and vehicles interrupts excessive currents, voltages, and temperatures at the cell and module levels. Protection in the form of electrical, software, mechanical and structural, and thermal and electronic safety measures work together to achieve safety standards on a par with aviation and aerospace standards. The modular battery's charging capabilities are noteworthy. Its fast-charging technology provides a 0-80 percent battery charge in 50 minutes and a 0-100 percent charge in 90 minutes with the 'Fast Charger' accessory. The 'Standard Charger' provides a 0-80 percent battery charge in three hours and a 0-100 percent charge in five hours. The vehicles integrate a CCS Type-2 charge port to support both AC and DC charging from public infrastructure. The F77 motorcycle technology The F77 motorcycle is equipped with a full suite of smart systems, rider aids, and interfaces for a completely connected experience. Display: A five-inch high-brightness colour TFT (thin-film-transistor) touchscreen located on the handlebar offers the rider a wide range of information on a display that is bright and easy to read.

Ride data:

The F77 includes a 9DOF (9 Degrees of Freedom) inertial measurement unit (IMU). The IMU enables the vehicle to capture nine distinct types of motion or orientation-related data: three degrees each of the acceleration, magnetic orientation, and angular velocity. Sensor data combined with sensor fusion technology provides the exact lean angle, accident and fall detection, rate of acceleration, and position of the motorcycle in every possible circumstance. Riders have access to this ride data through the mobile app, along with diagnostics information. The Ultraviolette Android and iOS apps effectively link an F77 owner with the motorcycle through their smartphone.

Connected features and preventive maintenance:

The F77 is a fully-connected smart vehicle with LTE connectivity and GPS positioning. This enables the FindMyBike feature to locate and even lock down the vehicle in real-time. The connectivity also enables preventive maintenance, a first for motorcycles, with problems being identified before the rider notices any measurable degradation in performance. The data collected from multiple voltage, current, temperature, and vibration sensors are used to diagnose and predict problems even before they can occur. With an efficiency-mapping technology, precise measurements of energy consumed are analysed in real-time. Every unit of energy transferred from the charger to the battery and from the battery to the electronics, and finally, the electrical energy delivered to the motor and mechanical energy delivered to the wheels is accounted for and monitored to ensure that all systems are operating to peak performance.

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.

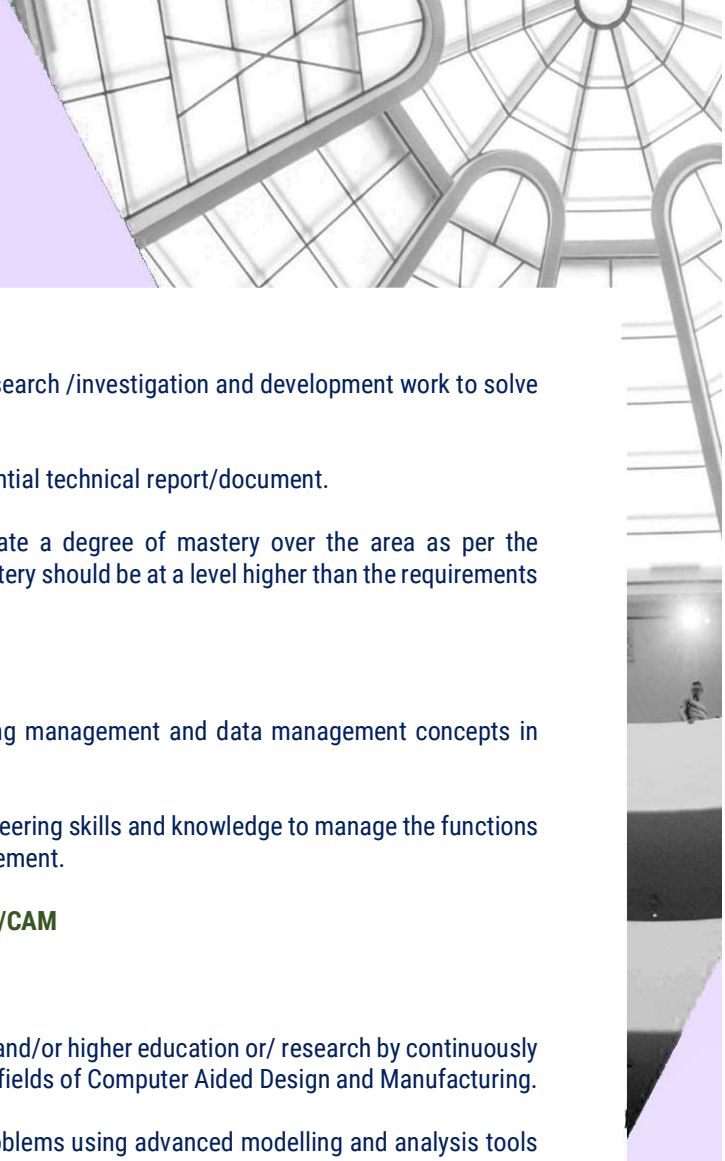
M. E. INDUSTRIAL ENGINEERING

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):

PO1 : An ability to independently carry out research /investigation and development work to solve practical problems.

PO2 : An ability to write and present a substantial technical report/document.

PO3 : 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):

PSO1 : Graduates able to apply the engineering management and data management concepts in industrial engineering areas.

PSO2 : 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):

PEO1 : 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.

PEO2 : Graduates can analyze the complex problems using advanced modelling and analysis tools and thereby solve problems related to product design and manufacturing area.

PEO3 : Graduates work individually and also in a team with effective communication skills and pursue lifelong learning.

PROGRAM OUTCOMES (PO's):

PO1 : An ability to independently carry out research /investigation and development work to solve practical problems.

PO2 : An ability to write and present a substantial technical report/document.

PO3 : 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):

PSO1 : Graduates will be able to apply the knowledge and skill in solving the real-time problems in the Computer Aided Design and Manufacturing field.

PSO2 : Graduates will be able to analyse complex problems and provide solutions using advanced tools in product design and manufacturing area.