



KUMARAGURU
COLLEGE OF TECHNOLOGY



Department of Mechanical Engineering

Newsletter

MExpress

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Dr. B. N. Sreeharan

Associate Editors:

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

Associate Editor's Folio

3D Printing, To Infinity and Beyond

Bleacher philosophers have long noted a distinction that baseball has from other sports: Where the gridiron and the basketball court are rectangular spaces that completely circumscribe the area of play, the baseball field extends, in at least one direction, to infinity. A ball hit between first and third, and the fielder chasing it, could, in theory, travel any distance and be in play. That poetry of open space is evoked by the Infinite-Build 3D Demonstrator additive-manufacturing (AM) system from Stratasys Ltd., developed with input from Boeing and Ford for large-part production in custom OEM and on-demand aftermarket applications.



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

The Infinite-Build addresses the requirements for large, lightweight, thermoplastic parts with repeatable mechanical properties. Its novel approach to FDM (fused deposition modeling) extrusion, according to Stratasys, increases throughput and repeatability. With traditional 3D printers, the printer head moves horizontally, adding layer upon layer so that the printed object grows vertically. The Infinite-Build turns that concept on its side. The Z-axis is oriented vertically so printing occurs sideways. Instead of building up, it builds out—completely out.



As new layers are added to the print at one end, the other end—what would have been the bottom if the Z-axis were horizontal—moves toward the back of the machine in 1" (25.4mm) increments. When the print reaches the back of the machine, it just keeps going. The back is open (though protected by thermal curtains to control cooling), and if support is supplied to the emerging print and build material is supplied to the printer, the print can keep getting longer.

Boeing is using an Infinite-Build 3D Demonstrator to explore the production of low-volume, lightweight parts. Ford is also exploring manufacturing applications for this AM system. Stratasys believes the design will prove to be a home run.

Departmental Activities

Faculty as Resource Persons



Dr. B. N. Sreeharan, AP (II) being the resource person delivered trained the faculty members of the institution in a one-day training programme "Creating Effective EXCEL Charts" organized by our KLDA on 06-04-2021.

Dr. P. S. Samuel Ratna Kumar, Assistant P, was invited by the Department of Mechatronics for a R & D publication discussion on 11-03-2021.



Dr. R. Manivel, Professor reviewed Seed Grant Proposals submitted by faculty of NGM, Pollachi on 19-03-2021. He was also appointed as Anna University Nominee for the BoS meeting at Department of Mechanical Engineering at Dr. MCET, Pollachi on 27-03-2021.

Dr. P.R. Ayyappan, Assistant Professor (SRG) became an editorial board member in Global Journal of Energy Technology Research Updates on 24-03-2021.



Dr. S. Bhaskar, Associate Professor, was the resource person in an online Session (One hour) - Crack Your Hurdles (placement training) – Organised for ECE students of KCT by ECE Association – Fantastic - 50 - 2 sessions on 25-03-2021 and 30-03-2021 and the resource person for the online Session (One hour) - Career and Self Development week-2 – "How to crack personal interviews" Organised for CSE students of KCT by CSE Association on 31-03-2021.

Mr. M. A. Vinayamoorthi, Assistant Professor (II), was the resource person in Two-day session on "Geometric Dimensioning and Tolerancing course" on 18-03-2021 and 22-03-2021.



Papers Presented



Mr. B. Jeeva, Assistant Professor, presented a paper titled "Experimental Investigation of three bladed Inclined Savonius hydrokinetic Turbine by using deflector plate" in the DST sponsored National Conference on Advances in Thermal-Fluids Engineering (ATFE-2021), organized by "Pandit Deendayal Energy University (PDEU), Gandhinagar, Gujarat conducted during 25.03.2021 and 26.03.2021.

Departmental Activities

Papers Submitted

Following faculty members submitted their papers for the various Scopus indexed and, in the journals, listed in annexure

Name of the Faculty	No. of Papers Submitted	Scope of the Journal
Dr. B. N. Sreeharan	4	Scopus / Annexure
Dr. R. Manivel and Mr. B. Jeeva	2	Scopus/WoS
Dr. S. Bhaskar	2	Scopus
Dr. K. K. Arun	2	Scopus/Annexure
Dr. S. Sivakumar	2	Scopus
Mr. S. Rajesh	1	Scopus



Papers Published



Dr. K. K. Arun, Assistant Professor – II published a paper entitled "A deep neural network-based shape unification to define a 3-Dimensional shape, in the Scopus indexed International Journal Materials Today: Proceedings, <https://doi.org/10.1016/j.matpr.2020.12.1130>

Papers Reviewed



Mr. P. D. Devan, Assistant Professor reviewed a paper titled "Enhancement of Mechanical and Wear Behavior of ABS/Teflon Composites" for the Scopus indexed International Journal Walailak Journal of Science and Technology.

Dr. P. S. Samuel Ratna Kumar, Assistant Professor reviewed the following papers for the Scopus indexed International Journal Elsevier-Materials Today Proceedings.

- Development of PCPDTBT Thin Film Based Highly Sensitive Organic Phototransistors
- Dynamic analysis of bi-dimensional functionally graded beams
- A contemporary review on additive manufactured biomedical implants



Departmental Activities

Book Chapter Publications

Dr. S. Thirumurugaveerakumar, Associate Professor along with Dr. C. Velmurugan, Professor & HoD and Dr. A. P. Arun, Assistant Professor - II published a book chapter "Prediction of Temperature Variation in Bus Duct System" in a book published by LAP LAMBERT, Beau Basin 71504, Mauritius.



Ph. D. Scholars



Research Scholars of **Dr. C. Velmurugan**, Professor and HoD, Mr. D. S. Ebenezer Jacob Dhas, Reg. No. 1314269702 defended his findings in the Ph. D. Viva Voce conducted on 24-03-2021 and Mr. S. Rajesh, Reg. No. 1414260104 submitted his synopsis during synopsis submission Meeting on 31-03-2021.

Consultancy

Mr. P. D. Devan, Assistant Professor provided the consultancy to CARE Group of Institutions on Modal analysis of natural fibre composites and generated a revenue of Rs. 2655/-.



Industry Linkages



Dr. B. N. Sreeharan, Assistant Professor – II, co-ordinated the process of internship cum placement at M/s. Synapse Robotics, Coimbatore. Results for the same is awaited.

Dr. V. R. Muruganatham, Associate Professor and **Mr. P. D. Devan**, Assistant Professor arranged internship cum placement at M/s. AVTEC, Hosur for 4 students from Mechanical, 2 students from MCE and 2 from E & I departments.



Departmental Activities

Mr. S. Suresh, Assistant Professor, **Mr. S. Rajesh**, Assistant Professor and **Mr. P. Pradeep**, Assistant Professor arranged internship cum placement for students at M/s. TVS Upasana Pvt Ltd, Hosur for 2 students from Mechanical Engineering Department.



Dr. B. Senthilkumar, Associate Professor had technical discussion with M/s. Sri Vivegha Engineering on 21-03-2021.

Mr. R. S. Mohankumar, Assistant Professor and **Mr. M. A. Vinayagmoorthi**, Assistant Professor – II arranged placement for 4 students from Mechanical Engineering Department at M/s. Anugraha Valves Limited, Coimbatore



In addition to the above, department arranged Internship for 2 students at M/s. Swagath Industrial Corporation and for 8 students at M/s. Sparktech Industries and for 6 students at M/s. Aaavin, Coimbatore.

Online Courses / Programmes attended / participated / completed



Mr. S. Sivakumar, Assistant Professor - II participated in a Training programme on Creating Effective Excel Charts on 06-03-2021 and in a Refresher course on Smart Grid, IOT, Green Energy Building from 16/03/2021 to 22/03/2021

Mr. S. Ramanathan, Assistant Professor - II participated in a One Week FDP on Novel Engineering Materials and Processing Techniques from 18.03.2021 to 22.03.2021.



Departmental Activities



Mr. S. Rajesh, Assistant Professor completed an Online Course on Introduction to Mechanical Engineering Design and Manufacturing with Fusion 360 on 01-03.2021

Mr. P. Pradeep, Assistant Professor participated in a webinar on "Industry 4.0: Digital Manufacturing" on 26.03.2021



Mr. M. Thirumalaimuthukumar, Assistant Professor - II participated in a webinar on Book writing on 01-04-2021.

Mr. M. A. Vinayamoorthi, Assistant Professor - II completed a Course on Writing research papers from 06-03-2021 to 27-03-2021 and participated in a Webinar on Leadership role in implementing Food Safety Management System Implementation on 26-03-2021.



Mr. K. Manikanda Prasath, Assistant Professor completed a NITTT on Course Module 1 conducted from 01/03/2021 to 30/03/2021.

Dr. V. Manivelmuralidaran, Assistant Professor - II completed an Online Course on Principles of Industrial Engineering conducted from 01-01.2021 to 15-04-2021.



Dr. T. Karuppusamy, Assistant Professor - II participated in a Workshop on Laser micro processing for Bio-medical applications from 15/03/2021 to 16/03/2021 and in a Workshop on Laser Processing from 15-03-2021 to 16-03-2021. He also participated in an FDP on Advanced welding processes from 22/03/2021 to 26/03/2021.

Dr. S. Sivakumar, Assistant Professor - II participated in a Training programme on Creating Effective Excel Charts on 06-03-2021.



Departmental Activities



Dr. S. Bhaskar, Associate Professor participated in an FDP on Essentials of Outcome Based Education from 15/03/2021 to 19/03/2021.

Dr. S. Balasubramanian, Associate Professor participated in a One day on Medical Textiles on 10-03-2021.



Dr. N. Sangeetha, Associate Professor participated in a webinar on m+p Analyzer –Experimental Modal Analysis (EMA) - India on 18-03-2021 and on m+p VibControl – Sine - India on 23-03-2021 and in a webinar on m+p VibControl – Random Vibration on 30-03-2021.

Dr. M. Balaji, Associate Professor completed an Online Course on Principles of Industrial Engineering from 01-01.2021 to 15-04-2021 and participated in a Time study of HOD PAs' on Work Measurement of HOD PAs from 15.03.2021 to 16.03.2021.



Dr. K. Ulaganathan, Assistant Professor - III participated in an FDP on Novel Engineering materials and Processing Techniques from 18/03/2021 to 22/03/2021

Dr. K. M. Senthilkumar, Associate Professor completed a Course on Writing research papers conducted from 06-03-2021 to 27-03-2021.



Dr. K. K. Arun, Assistant Professor - III participated in an FDP on Green Technology & Sustainability Engineering from 15/03/2021 to 19/03/2021.

Dr. B. N. Sreeharan, Assistant Professor - II participated in a Webinar on Lean Start-up & Minimum Viable Product/Business on 05-03-2021 and in another Webinar on Effective Writing of Proposals for Research Grants on 13-03-2021. He also participated in an FDP on Essentials of Outcome Based Education from 15/03/2021 to 19/03/2021 and in a Webinar on Industry 4.0: Digital Manufacturing on 26-03-2021.



Mechanical Engineering Association Activities

LATERAL ENTRY ORIENTATION PROGRAMME BATCH (2019-2023)

LATERAL ENTRY ORIENTATION PROGRAMME was conducted on the behalf of our MEA association to welcome our lateral entry students and to know about our department and faculties and events conducted in our department and our college such that the students would get a clear idea about our department and our MEA association.

This programme was conducted on 2nd march, 2021. Agenda was shared to students of our department. This programme was conducted with different topics. We started our brief introduction about our department and then about our department faculties and

DEPARTMENT ASSOCIATION:

- Mechanical Engineering Association (MEA) is a technical association which is run by group of students irrespective of years under the guidance of the HoD Dr. C Velmurugan Faculty Coordinators Dr. V.R. Muruganantham and Mr. S. Rajesh.
- MEA is headed by President followed by Vice President and Treasurer.
- It encourages the student to grab the opportunities to enhance various technical and interpersonal skills.
- It conducts many events within the department and also a proud representer of KCT in Yugam with events.




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faculties area of specialization. We presented about our department culture and its activities, clubs and forums was explained to make sure that students get to know their interest and get to know more about it and we presented the technical presentations to the students.

Then about our YUGUM an techno-cultural event conducted every year in our college which was explained to the students to get to know about our inter college level events.

We had an open talk with our students to make it as an interactive session and clarified the questions which they had in their mind and to get interacted with our seniors in our department. The main objective of conducting this LATERAL ENTRY ORINTATION PROGRAMME was

DEPARTMENT OF MECHANICAL ENGINEERING
MECHANICAL ENGINEERING ASSOCIATION
ORIENTATION ACENDA-II Years Lateral Entry
Session Time: 45 Minutes | 4:30 PM - 5:15 PM | 2nd March 2021

OBJECTIVE:
To provide a welcoming atmosphere for the upcoming second year lateral entry students to meet faculty, and the current pursuing students as they step into KCT.

Overall Moderator: Mr. Ashwinth kv & Mr. Praveen Kumar J
Platform: MS Teams

Detailed Agenda:

S. No	Activity	Topics	Time	Duration
1	Welcome Address	Mr Praveen Kumar	4:30 PM - 4:35 PM	5 Mins
2	Department Faculties	Mr. Manav R Samant	4:35 PM - 4:40 PM	5 Mins
3	Department Culture	Mr. Adwin Boloji R	4:40 PM - 4:50 PM	10 Mins
4	Clubs And Forums	Mr. Nitheshwar RK	4:50 PM - 4:55 PM	5 Mins
5	Technical Presentation	Mr. Kishore Krishna S.	4:55 PM - 5:00 PM	5 Mins
6	Yugam	Mr. Ashwinth KV	5:00 PM - 5:05 PM	5 Mins
7	Open Discussion	-	5:05 PM - 5:10 PM	5 Mins
8	Vote of Thanks	Mr. Praveen Kumar J	5:10 PM - 5:15 PM	5 Mins

to welcome our lateral students and to get them know about our department and faculties and to make them to know about our department activities, clubs and events organized and to know about our college. The overall moderators of the program were Mr. Ashwinth K V & Mr. Praveen Kumar J.

Mechanical Engineering Association Activities

First Year Recruitment

The recruitment was organized by MEA members for the intake process of our 1st years.

This recruitment was coordinated by,

FACULTY COORDINATORS:

- ❖ Dr. V. R Muruganantham
- ❖ Mr. M.A. Vinayagamoorthi

STUDENT COORDINATORS:

- ❖ Mr. Sreejith Ravichandran R
- ❖ Mr. Sangeeth Kumar B
- ❖ Mr. Kishore Krishna S



Initially the recruitment was started by circulating Microsoft forms from 26.02.2021-1.3.2021. Based on their responses students were assessed by a personal interview. Totally there were four panels, and each panel consists of 2 third years and 3 second years. This interview process took place on 4.03.2021 and 5.03.2021.

They were mainly assessed by their personal attributes, General attitude & politeness, Content clarity, Candidate integrity and Communication. Totally 18 members were selected for the probation period.

PROBATION PERIOD:

Probation happened for a period of nearly four weeks in which students were given an individual tasks and a group task based on their interest. The students were divided into 6 groups and each group was monitored by our MEA members as given below

PROBATION					
GROUP-I		GROUP-II		GROUP-III	
Mr.Praveen B		Mr.Suriya G		Mr.Srivathsan	
Mr.Kishore Krishna S		Mr.Manav Samant		Mr.Suvanraj R	
Mr.Padrinarayan R		Mr.Praveen Kumar J		Mr.Hemavijay B	
		Mr.Aswin Baalaje R		Mr.Ashwinth KV	
1	Kashyap Rajeev	1	Anjana Prasad	1	Anantha Kumar S
2	Jobisha Celin A	2	Imayan K T	2	Harshavardhan
3	Roshan V	3	Gowshick G	3	Theva Surantharan.R
GROUP-IV		GROUP-V		GROUP-VI	
Mr.Deepan Issac T		Mr.Sreejith Ravichandran		Mr.Joshua Peter	
Mr.Mohamed Thoufeek M		Mr.Nishanth S		Mr.Jayabalu	
Mr.Sangeethkumar B		Mr.Sudharsan K		Mr.Vivien Wilfred S	
		Ms.Preethi Sri		Mr.Nitheeshwar R K	
1	Murugashri V	1	Aakash kumar V	1	Balavignesh P
2	Shakeel Akthar S	2	Tarun R S	2	Nithish S V
3	Kalaiselvan P (1)	3	Ananthu Krishna G V	3	Kumarasamy R

Mechanical Engineering Association Activities

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.

In this event they were ready to assess diverse areas such as problem solving, logic and technical and linguistic capacity also explore and develop their aptitude solving skills to score better in every competitive exam or placements.

Aptitudes event for this event was conducted on 06th March 2021. Syllabus has been framed and questions are selected for the test on Qualitative and Quantitative Reasoning. The questions were prepared from the topics Partnership, Surds, Cloze test, and Syllogism.

The test comprised of 30 questions for which 4 marks were awarded for each correct answer and each wrong answer a mark was reduced. This event was conducted successfully under the guidance of Dr. V. R. Muruganatham and Mr. M. A. Vinyagamoorthi, Faculty Coordinators, MEA, coordinated by Ms. Preethi Sri S. and Mr. Mohamed Thoufik. More than 60 registered for the event and 45 have participated and benefitted from the event.

Mr. Aravindhan S 17BME056 and Ms. Navina B S 20BSI028 were the winner and the runner, respectively.



Students Participation & Achievements

- ❖ **Mr. Akash Velanhanni D (20BME008)** – 1st Year Mechanical A section took part in a competition '**MY MAN MY BOSS**' from 13th march to 20th March 2021 conducted by PHOENIX ARTS, Coimbatore.
- ❖ **Mr. Ibrahim Basha B (18BME095)**- 3rd Year Mechanical B section took part in a competition '**TECHONOVATION 2021**' from 6th to 7th March 2021 conducted by **NIT Jalandhar**. He also applied and worked as intern at **Techni Spark industries**, Avarampalayam, Coimbatore from 6th to 22nd March.
- ❖ **Mr. Janarnathan D (19BM146)** – 2nd Year Mechanical C section participated in '**Kabaddi Zonal Sports Meet**' organized by **Anna University** on 27th March 2021.
- ❖ **Mr. Barani M (19BME091)** – 2nd Year Mechanical B section attended webinar on various topics '**Fundamentals of lubrication system, CNC Programming, Geometric Dimensioning & Tolerancing**' conducted by **Skyriders Institutions**.
- ❖ **Mouleeswar K (20BME073)** – 1st Year Mechanical B section attended a one-day internship in **Veerzo** on 15th March 2021.
- ❖ **Prasanth M (18BME100)** – 3rd Year Mechanical B section applied and worked as an intern at **Sunlife Tools**, Chinnavedampatti, Coimbatore from 22nd to 27th March 2021, He also worked as an intern at in **Techni Spark industries**, Avarampalayam, Coimbatore from 16th to 22nd March 2021.
- ❖ **Mahesh Kumar U (18BE122)** – 3rd Year Mechanical C section applied and worked as an intern at **Neyveli Township**, Cuddalore from 16th February to 1st March 2021.
- ❖ **Yeswanth Ragav M (19BME246) & Nirmal Kumar D P (19BME228)** - 2nd Year Mechanical A Section both applied and worked as an intern at **Sakthi Gears**, Coimbatore from 15th to 28th February 2021.
- ❖ **Mr. Praveen (18BME092), Mr. Prasanth(18BME100), Mr. Krishnaprasad(18BME105), Mr. Joshua Peter (18BME084)** has participated in **HackerJack 1.0** organized by Bannari Amman Institute of Technology.



Students' Articles

THE BRAND THAT MADE MAN FALL IN LOVE WITH THE MOTORCYCLE



Introduction:

This article is about the Indian motorcycle manufacturer. Royal Enfield is an Indian multinational motorcycle manufacturing company with the tag of "the oldest global motorcycle brand in continuous production" manufactured in factories in Chennai in India. Licensed from Royal Enfield by the indigenous Indian Madras Motors, it is now a subsidiary of Eicher Motors Limited, an Indian automaker. The company makes classic-looking motorcycles including the Royal Enfield Bullet, Classic 350, Meteor 350, Classic 500, Interceptor 650, Continental and many more. Their motorcycles are equipped with single-cylinder and twin-cylinder engines. First produced in 1901, Royal Enfield is the oldest motorcycle brand in the world still in production, with the Bullet model enjoying the longest motorcycle production run of all time.



Mr. Suvanraj R
19BME100
II Year Mechanical -B

History

After the Indian Independence Act 1947 the new government looked for a suitable motorcycle for its army to patrol the country's border. In 1952 the Royal Enfield Bullet was chosen as the most suitable bike for the job. In 1954, the government ordered 800 in units of the 350-cc model. In 1955, the Redditch company partnered with Madras Motors in India to form 'Enfield India' to assemble, under licence, the 350 cc Royal Enfield Bullet motorcycle in Madras (now called Chennai). The tooling was sold to Enfield India so that they could manufacture components. By 1962, all components were made in India. The Indian Enfield uses the 1960 engine (with metric bearing sizes), Royal Enfield still makes an essentially similar bike in the 350 cc and 500 cc models, along with several different models for different market segments. In 1990, Royal Enfield collaborated with the Eicher Group, an automotive company in India, and merged with it in 1994. Although Royal Enfield experienced difficulties in the 1990s and ceased motorcycle production at their Jaipur factory in 2002 by 2013 the company opened a new primary factory in the Chennai suburb of Oragadam on the strength of increased demand for its motorcycles. This was followed in 2017 by the inauguration of another new factory of a similar size to the facility at Oragadam (capacity 600,000 vehicles per year) at Vallam Vagadal. The original factory at Tiruvottiyur became secondary and continues to produce some limited-run motorcycle models.

2015 floods

Flooding, produced by the heaviest rainfall in Chennai in over a century, caused Royal Enfield to cut production by 4,000 motorcycles in November 2015, followed by a shutdown of the plants in Thiruvottiyur and Oragadam on 1 December, as well as the company offices in Chennai. Production resumed at 50% capacity on 7 December and operations at both plants were back to normal on 14 December

Students' Articles

Interceptor and Continental GT

Royal Enfield unveiled a 650-cc twin-cylinder engine at their Technology Centre in Leicestershire, England, in November 2017 to power a new generation of Royal Enfield motorcycles. It was showcased at the Milan Motorcycle Show on 7 November 2017 in Italy, where two motorcycles based on the engine, the Interceptor 650 and Continental GT 650 were revealed. Both models were introduced to the US market in November 2018 to positive reviews. The Interceptor is marketed as the INT650 in the United States where Honda has a trademark on the Interceptor name. The 650cc twins are currently (2020 - 2021) the best-selling motorcycles in Great Britain.



2020 Meteor 350

Royal Enfield launched a new line-up of cruiser motorcycles on 6 November 2020. It replaced the Thunderbird 350 and 350X series which were discontinued earlier that year. It uses a 349-cc single cylinder engine featuring a single overhead camshaft system (SOHC), and a completely new engine with fewer moving parts than the 346 cc of the Classic 350. It is the first Royal Enfield to offer the Tripper Navigation system.

Retro looks

Yes! A Royal Enfield gets that old-world charm with its retro-styled looks and a thumpy single-cylinder motor to boot. With its curvaceous nature, chrome fittings, hand-painted fuel tank, the Royal Enfield is in every sense of the word, retro.



Conclusion

RE should tie up with adventurous students or corporate executives and arrange adventurous trips on weekends to locations- like Cherapunji, Ionaval etc. brand Ambassador should join them occasionally to promote the event. Television Commercial spots are more remembered than Print Advertisements even when they are over 6 years old. So, users should be given the chance to video shoot their trips and share with other TV viewers. Lucky users should be offered a chance to meet the Brand executive on next trip. They should tie-up with adventurous brands like Thumps Up or Mountain dew to give a complete revamp of branding. Mostly, young people are going eagerly for buying this Royal Enfield bike.

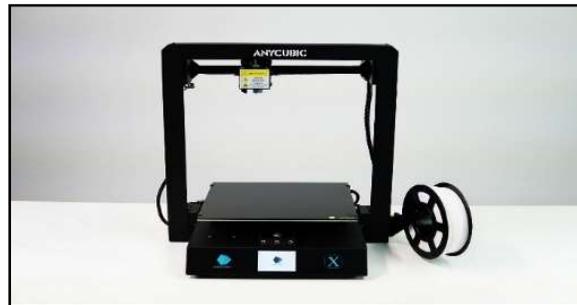
Students' Articles

MY FIRST EXPERIENCE ON 3D PRINTER

- Mr. Mohan R

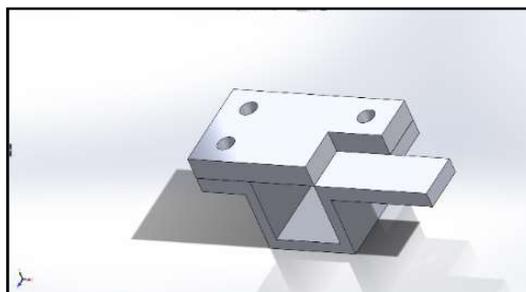
The manufacturing sector produces products which can satisfy our daily needs and necessities. Now, 3D printing is an emerging concept of the manufacturing sector. With a 3D printer, we can print anything that we need right at our home. As a mechanical engineer, I was excited to work with the 3D Printer and see what I gained from my first experience on the 3D printer.

Firstly, I don't know about the 3D printer and how it works. But I had my very first experience on Anycubic mega i3 3D printer which is having a build volume of 210 x 210 x 205 mm and PLA filament to print. One of my seniors asked me to design and manufacture a clamp for his project. So, I decided to use 3D printer to print that clamp. First, I designed a model for the clamp using the Solidworks software and saved it as an STL file. Then I loaded the file in the Ultimaker Cura to slice my 3D model. Then I saved it in the removable disk and put the file in the 3D printer. I went towards the printer and saw how it was working. I did not know though that the first model I chose to print was going to be the biggest of my first prints. It took 4 hours 30 minutes to print completely. When I removed the clamp from the bed, I was astonished! since the finished product was well printed, had a good quality, and good looking.



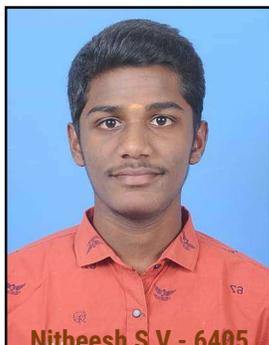
Then What? More 3D prints!

I searched a lot about the 3D printers and finally came to know that we can fabricate or customize our 3D printers. And on my first experience, I learned how to use the printer, how the extruder works. My plan is to design more 3D models to try different 3D printers and with different materials.



Students' Articles

PAPER BATTERY



Nitheesh S V - 6405

I Year Mechanical

Introduction: A paper battery can be defined as a Flexible, Ultra-thin energy storage device. It is made up of cellulose and Carbon Nano Tubes. It has the capacity to act as a "High Energy Battery and also as a Super Capacitor". They are even Environmentally – Friendly. It acts as a High Surface area electrode by incorporating the Nanoscopic scale structures to improve the conductivity. Their functioning is like the Chemical Batteries and the only difference is "Non-corrosive" and not to worry about extensive housing.

Construction: A xerox paper with suitable length, a specially formulated ink (with CNT) to spread over the paper, On the other side a thin film of lithium is laminated, Aluminium rods - for carrying current.

Working of paper batteries:

It consists of a "Carbon Nano Tube (CNT)" which acts as a 'Cathode', and "Lithium" acts as a 'Anode'. The 'Electrolyte' used here are "Bio electrolytes such as Blood, Sweat, Urine, etc;". "Paper" acts as a 'Separator'. Anode and Cathode acts as a metal electrode and are kept in a way that to be in contact with electrolyte. Circuit closes when load is connected and current starts to flow, due to the occurrence of Electro chemical reactions.



Oxidation and Reduction takes place at the Anode and Cathode, respectively. Anode loses electrons into ions from electrolyte to form a compound, and so it will be Positively charged. Cathode does it vice-versa, it gains the electrons from electrolyte to form the compound and so it will be negatively charged. Paper acts as a Separator, which separates the anode and cathode to prevent their contact, because when it comes to contact there will be no current flow. The batteries are compact in size, for easy usage and so cathode and anode are closely packed.

Advantages: Used as both battery and capacitor, Flexible, Ultra-thin energy storage device, long lasting, Non-toxic, Steady power production, Biodegradable, Reusable & Recyclable, Durable, Rechargeable, No Leakage & Overheating.



Disadvantages: Carbon Nanotubes are complicated and expensive, Prone to tearing, Nanotubes made from carbon are expensive due to use of procedures like electrolysis and laser ablation, should not be inhaled, as they can damage lungs.

Applications: Devices that consume less power like calculators, wristwatch, etc; Laptop batteries, mobile phones, cameras, Wireless communication devices like mice, keyboard, Bluetooth headphones, etc.

Industry Startups

New Trend 'The Royal Vintage again on Indian Roads'



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

A small-scale automaker caught our interest when we caught wind of its growing popularity among the local populace of Haryana and numerous celebrities. The brand is celebrated because of its indigenous roots and its eco-friendly vintage cars that make an ideal companion to drive around the town. Currently Green Masters offers three vehicle options in its complete Electric Wax Wings Car roster—base model, top model, and a kids' car.

At a price of INR 170,000, the Electric Wax Wings Car Base Model offers several amenities. Powered by a Lead Acid battery, the car travels a total distance of 100 km per single charge and the 48 V battery takes around 4-5 hours to fully revitalise when connected to a domestic power outlet. The 315 kg vehicle has a 20-l luggage space and can carry a maximum weight of 200 kg while travelling at a peak velocity of 40 km/h. The size 19 tyres add to the car's aesthetic appeal and widen its stance.



The vehicle seems optimal for lazy evenings and relaxed drives along smooth winding roads. The 48V lithium-ion battery fitted in the top model boosts the vehicle to a top speed of 45 km/h. This version is 15 kg lighter than its basic counterpart and carries a max weight that is 50 kg more as compared to the base model. These features come with a top model price tag of INR 220,000 and a two-year warranty on with its battery.

Green Masters also offers an INR 80,000 mini version for children, which sports the same battery as their top model. Its 20km/h top speed is kid-friendly, and the vehicle is extremely light at just 100 kg. The brand gained extreme exposure after featuring in a Sidhu Moosewala song video and when two JDU MLCs pulled up to the Bihar Legislative Assembly in the Electric Wax Wings. The company has made 2050 successful deliveries and the customers have been full of praises after driving their cars. All major operations including servicing and repairs take place in Sirsa. Brands like Green Masters will certainly be helpful in government's initiative of bringing EVs to the public.



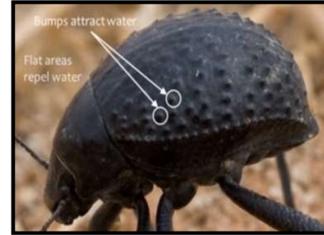
Biomimicry 'The Design of Nature'

IS IT POSSIBLE TO GET WATER FROM FOG?



Mr. Jayabalu S
19BME219
II Year Mechanical -A

Humans and animals are struggling to get water in summer season. This situation happens for us also, even when we get more than 90cm rainfall in a year. Then how the animals would get water in arid areas like Desert. Because the rain has showered less than 2 cm in a year. Researchers at the Massachusetts Institute of Technology found that there is a way to get water from fog (moisturized air) by Biomimicry. Using this method, they got the solution by concluding desert beetle called "Stenocara gracilipes".

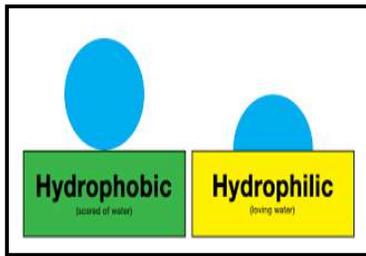


STENOCARA GRACILIPES

Stenocara gracilipes is a species of beetle that is native to the Namib Desert in southern Africa. This is one of the most arid areas of the world. The beetle can survive by collecting water on its bumpy back surface from early morning fogs. To drink water, this beetle stands on a small ridge of sand using its long, spindly legs. Facing into the breeze, with its body angled at 45°, the beetle catches fog droplets on its hardened wings. Its head faces upwind, and its stiff, bumpy outer wings are spread against the damp breeze. Minute water droplets from the fog gather on its wings, there the droplets stick to hydrophilic bumps, which are surrounded by waxy, hydrophobic troughs. Droplets flatten as they contact the hydrophilic surfaces, Accumulation continues until the combined droplet weight overcomes.



Researchers have emulated this capability by creating a textured surface that combines alternating hydrophobic and hydrophilic materials. Potential uses include extracting moisture from the air and creating fog-free windows and mirrors and to get water in arid areas. A company called NBD Nano is attempting to commercialize the technology.



What is hydrophilic?

A hydrophilic molecule or substance is attracted to water. Water is a polar molecule that acts as a solvent, dissolving other polar and hydrophilic substances

EXAMPLE: Salt, Sugar and Cellulose

What is hydrophobic?

Hydrophobic literally means “the fear of water”. Hydrophobic molecules and surfaces repel water. Hydrophobic molecules are usually non-polar, meaning the atoms that make the molecule do not produce a static electric field.



EXAMPLE: Oil, Petrol and Fats.

APPLICATIONS:

- **FOG NET** -Fog collection refers to the collection of water from fog using large pieces of vertical mesh net to make the fog-droplets flow down towards a trough below, known as a fog fence, fog collector or fog net. This net was manufactured by the Namib Beetle concept.



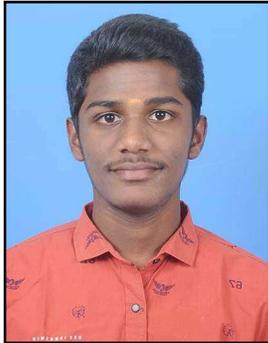
- **DEW BANK BOTTLE** - This is another application of Namib Beetle concept the top dome surface is designed by this concept and the water is collected and stored in that ring shaped container.

- **SELF FILLING WATER BOTTLE** -This bottle was manufactured by NBD nanotechnologies is an American company. In this a sheet is used and this is made by the concept Namib Beetle and it is collected and stored in bottle



Reviewer's Point

CITROËN C5 AIRCROSS



Nitheesh S V
6405
1 Year Mechanical

Introduction:

It is a car manufacturing company, which originated in French. It was started in March 1919, by the Industrialist "[André-Gustave Citroën](#)". Recently it has also been a part of "Stellantis" since 2021. Their first car was "Traction Avant" which is produced with Front wheel drive, Four-wheel drive with independent suspensions, Unibody chassis instead of the separate one. Highlighting feature is, they used the whole body of the car as the main load bearing structure.



Citroën C5 Aircross:

So, taking C5 Aircross into consideration, it is one of the upcoming cars in India, and it is the first car to be launched in India by the company. Basically, it is Compact Crossover SUV (Sports Utility Vehicle) and is produced since 2017, by the french company. The first sale was started in China in 2017 and gradually they started to grow. Now they have planned to enter the Indian market and a great is expected from them. This car is expected to launch in India soon in April 2021.

SPECIFICATIONS:

Starting from the heart of the vehicle, i.e., Engine Specifications, it comes with a Four cylindered "DW10FC" Diesel engine under BS VI norms, with a displacement of "1997cc". The engine type "DW10FC" is the official name given by the manufacturer, by the terms of variant and number of cylinders. It has an 8-Speed Automatic gear box, with a beautiful and a flexible paddle shifter and includes the Sport mode. The maximum power given is 174.33 @ 3750rpm, which is really a great suitable one for our roads (Engines with more power attains the most possible top speeds but affects the fuel economy) and mainly coming to the torque, the maximum torque they given is 400Nm@ 2000rpm (Engines with high torque at low rpm indicates that engines are very responsive and do not require frequent gear changes and helps in increasing the fuel economy). Highlighting feature is that engine attains the maximum torque at very low rpm itself (2000rpm), which is nearing to the idle rpm. So, by seeing all the specifications, we can say that it has a very great pulling power with a very nice punchy performance from this diesel variant. Coming to the main part where everyone is worried at this situation is the Mileage. So, the company claims as 18.6kmpl (Which is claimed after the testing done by ARAI). So, we can surely get above 14kmpl at city conditions, and in highways it may give nearly 18kmpl. So, I think it is a decent mileage at this engine performance. Still now they have announced that this car comes with a Forward Wheel Drive train (FWD).

Exterior comfort components:

It comes with a “Macpherson strut Suspension with Double Progressive Hydraulic Cushions” in the front and “Twist Beam Axle with Single Progressive Hydraulic Cushions” at the rear. These two are Compression and Rebound Suspensions. These components are manufactured by this company itself. By seeing the properties of the suspensions, we can surely say that it gives the most comfort even in off roads also. Comes with both front and rear powerful disc brakes. Come with Power Steering. Minimum turning radius is 5.35m with a massive tubeless Tyre of 235/55 R18, with ‘SWIRL’ Two Tone Diamond Cut Alloy wheels.

It has smart trunk opener, rear view mirrors, orvm turn indicators, hazard lights, trunk light, Integrated roof spoiler, roof rails, DRL LED headlights, front and rear fog lamps with front cornering function, Vision Projector Halogen Headlamps. It has a massive panoramic roof, which gives a super airy feel, so that it makes us more comfortable. Exterior is generally well refined with many new and different advanced features. The exterior body make gives us a classic look with attractive designs.

Available variants:

It comes up with two different variants.

- C5 Aircross Feel: Which is claimed as 28 lakhs as Ex-showroom price.
- C5 Aircross Shine: Which is claimed as 30 lakhs as Ex- showroom price.



Basically, both the variants are with same Diesel engines and differ only in few specifications.

My own Overall review:

The above mentioned were based on the information claimed by the manufacturers. The next coming will be the short and a clear review. Basically, my thought was that this C5 Aircross will give a tough competition for Hyundai Tucson, Skoda Karoq and Jeep Compass.



The type of building the headlamp design, brings a feel of being in a French area. The bumpers and fog lamps and the contrasting colors are perfect but if it is available in the Sporty design, I am sure that, the design will be to the peak level, but unfortunately it is not offered till now, but can be expected.

In the sideways, the rounded curves and the lines makes the car look more crossover than the SUV type. The way the cladding has made is totally ultimate and which also includes the big 18inch alloy wheel dual tone design, is really an amazing one. They also give the full-size spare wheel, which is a big plus point. So, in this choice, I will surely go for the Dual – tone option with a Black roof, so that we might get a rich sporty look. At the rear, it gets an Oval shaped LED taillight. It has a sporty two rear exhaust vents, which come from the bumper cladding.



Coming to the instrument cluster, the front split AC vents in the French style and the Gear level in the Yatch shape, gives a very luxury handle.



The steering wheel design, with Square centre looks terribly unique and makes a great identity, with chunky Paddle Shifters. It has an 8-inch, infotainment system with the support of Apple



Car Play and Android Auto. The dashboard has been programmed with three features, Personal, Minimum and Dual modes. Most highlighting features are Panoramic sunroof at this segment, Dual zone climate control, Memory function seats for more comfort, very attractive Ambient Lighting, Powered Driver seat and Tailgate.

SAFETY features:

6 airbags, ABS with EBD, ESP, parking sensors, 360 view camera, TCS, Blind spot monitor. Most safety and lovable feature are Grip Control System, with five modes: Snow, Sand, Standard, TCS off, All terrain (Automode).

Basic Mindset is “Citreon” is for Comfort. The boot capacity is 580 liters. It can be expanded to 780 liters if the rear seats are reclined. Further expanded to 1,630 liters, when the rear seats are folded further. The rear seat has a special comfort, since they are not a whole single seat, rather they are placed as three different chairs. It comes with a powerful punchy 2.0-litre diesel engine, which gives an output power of 177PS and 400Nm of torque. It has an automatic 8 speed gear box with FWD transmission. Additionally, they have introduced their own “Progressive Hydraulic Cushion” Suspension System.



CONCLUSION:

My opinion is, by seeing the released specifications, it is priceworthy and will give us more than we expect. So, this crossover would be the best riding car in this budget segment.



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):

- 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 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):

- 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.