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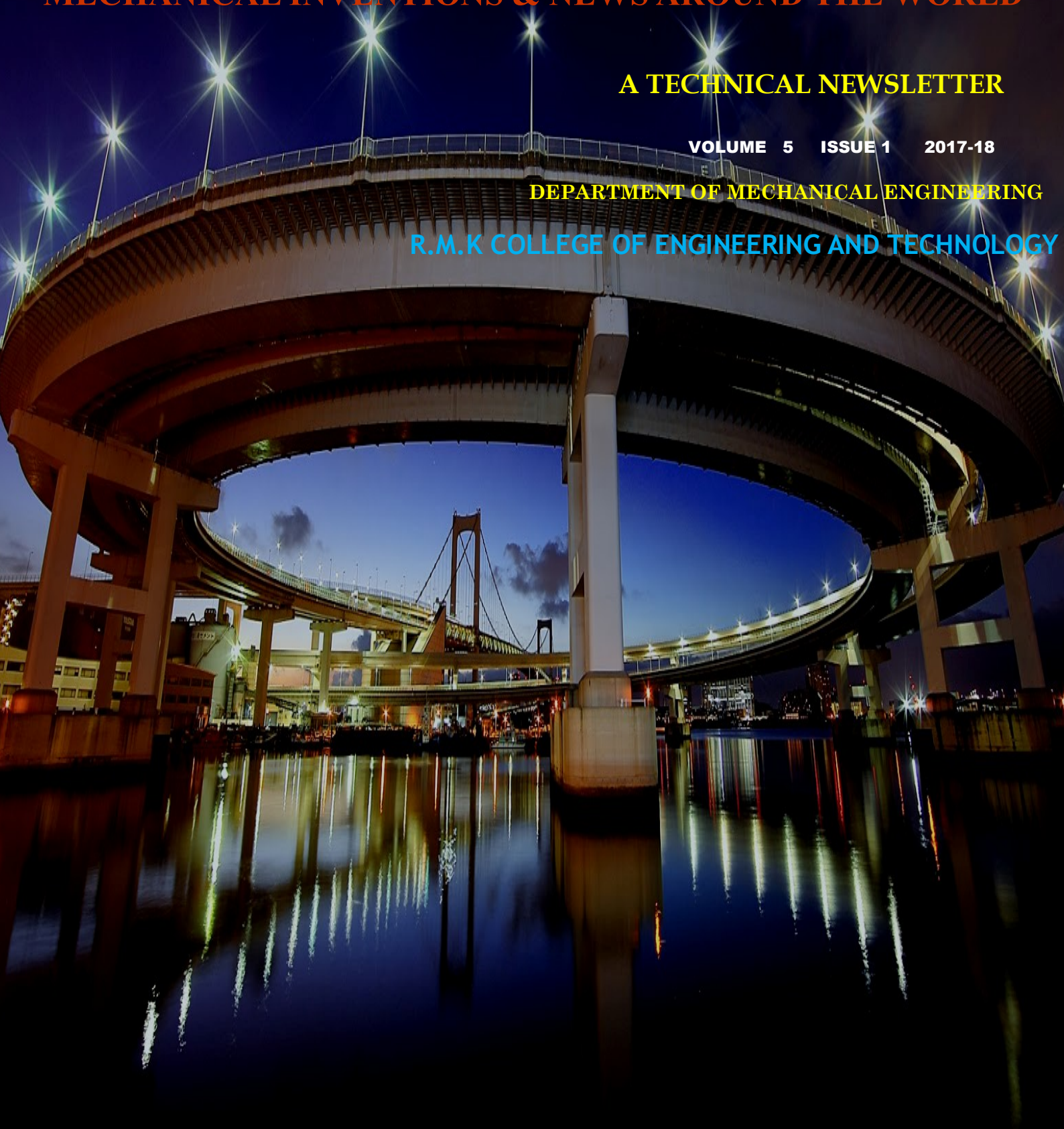
MECHANICAL INVENTIONS & NEWS AROUND THE WORLD

A TECHNICAL NEWSLETTER

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DEPARTMENT OF MECHANICAL ENGINEERING

R.M.K COLLEGE OF ENGINEERING AND TECHNOLOGY



Scientists Turned This Dragonfly Into A Remote-Controlled Cyborg Drone



Remember that old engineering project that turned [cockroaches into cyborgs](#) that you can control using electrical impulses? Yeah, that was awesome. And kind of gross. In a new project called Dragonfleye, researchers are doing the same thing to dragonflies, turning the fast-flying insect into a cyborg drone you can pilot remotely.

Similar to the cockroach project, the dragonflies are fitted with a tiny backpack of electronic components that allow the researchers to communicate with the insects. In this case, however, the dragonflies have had their neurons genetically modified so that they are more sensitive to light, allowing the insects to be controlled using measured light pulses.

Dragonfly is a collaboration between the Charles Stark Draper Laboratory and the Howard Hughes Medical Institute, with the former in charge of developing the backpack and the latter performing the genetic modifications and the succeeding experiments. Unlike the cockroach backpack from before which were non-invasive, these ones actually wrap optical fibers around the dragonfly's nerve cords, allowing them to selectively target those neurons related to flight.

According to the researchers, using dragonflies in place of traditional drones can be advantageous, since they're smaller, lighter, and way stealthier than anything else that's manmade. We're not entirely sure about the planned applications for these things, but we'll hazard a guess it's along the lines of whatever James Bond, GI Joe, and S.H.I.E.L.D. does when they're on the clock.

U ARMSWIFT PRO



Ever see an [industrial robot arm](#) and silently wish that there's a residential version that you can put to work at home? Now you can with the uArm Swift Pro, an open-source robot arm that you can program to do whatever dastardly things your mind can come up with.

An Arduino-powered robot arm, the rig boasts four-degrees of articulation for executing complex movements, with a joint that moves using a customized gearbox and stepper motor module. A parallel mechanism structure allows it to weigh a light 4.9 pounds, too, ensuring you can move around the house without any issues. The uArm Swift Pro comes



with a suction cup, a gripper, a universal holder, a 3D printing finishing kit (yep, it will finish your 3D objects for you), and a laser engraving kit, each of which can be attached to the head to accomplish any desired tasks. For control, it can be manually operated either via mouse-and-keyboard or a companion mobile app, as well as programmed using a graphical interface based on Blockly. It can also learn movements by physically moving the arm, as it can remember motion sequences and repeat it when triggered.

Do note, it handles maximum payloads of just 1.1 pounds, so while it can carry a brush and paint your walls, you won't be able to use it to hold your power tools in the workshop. It's compatible with a variety of tools available in the market, too, including those from GroveKits and OpenMV. An Indiegogo campaign is currently running for the uArm Swift Pro. You can reserve a unit starting at \$449.

Scientists Just Made Mind Reading A Highly-Probable Part Of The Future

Reading minds has long been a staple of science fiction abilities. Like many superpowers, we're working towards gaining them via the magic of science. And researchers just took a big step towards realizing it in a system called Brain-to-Text.

Developed by a team from the Cognitive Systems Lab at KIT and the Wadsworth Center in New York, the system basically reconstructs speech by reading a person's brainwaves. They weren't just able to identify words, but complete sentences in continuous speech, effectively inventing a system that works like an [artificial intelligence](#) telepath of sorts.

In Brain-to-Text, seven volunteer epileptic patients were hooked up to electrodes to monitor speech-related brainwaves while reading aloud sample texts. Recordings from these sessions were combined with the interdisciplinary team's knowledge in machine learning and linguistic processing, enabling the development of a novel method for taking the brainwaves and converting them into its text equivalent. Being able to read the minds of a small sample of seven people, of course, is far from a legit superpower, aside from the fact that it's restricted to decoding brainwaves from audibly spoken language rather than actual thoughts. It is, however, a significant step in our quest to develop some of that Professor X swag and gives us hope for a real science fiction future.

According to the team, they hope that the technology will lead to the development of a method for speech communication for patients who cannot verbally communicate, whether due to paralysis or any other disability.



Google X's Energy Kites Redesign The Wind Turbine As A Flying Power Generator



Wind turbines are great, harnessing natural wind to produce electricity. Despite that, they still don't make economic sense in plenty of places, especially those where strong winds aren't quite as abundant. These experimental Energy Kites from Google X can change that.

Designed by California wind energy company Makani Power, it ditches the tall towers where wind turbines are traditionally installed. Instead, it puts the turbines on plane-like kites that can be launched at heights way further than most towers go, harvesting power from the stronger gusts of



wind that exist at those higher altitudes.

Each Energy Kite consists of three main parts: the kite, the tether, and the ground station. The kite is launched to a height of 1,500 feet using integrated rotors, which act like helicopter propellers to get it off the ground. Once it reaches the summit, the kite is designed to move in a circular direction, which turns the kite's integrated propellers, causing the internal turbines to spin and generate power. All produced electricity is sent back to the ground station via the tether, which is made up of conductive wires surrounding a high-strength core.

Why go this route? According to Google, the system is considerably cheaper and easier to build than traditional towers, making them a major resource-saving alternative. On top of that, its ability to harvest power at 1,500 feet above-ground allows the kites to capture as much as 50 percent more energy than traditional ground turbines, making them an overall more efficient solution.

Mercedes-Benz F 015



The German automaker showed up with one of the most outrageous and radical concept cars fertile imaginations can concoct. And it's self-driving, to boot. It's also something CES, the place where all cutting-edge tech is celebrated, probably needed badly.

Outside, the vehicle is as futuristic a design as you can imagine, something you aren't likely to see anywhere other than a science fiction movie. Inside, it looks more like a music lounge straight out of the Jetsons than a car, with reflective surfaces, white and blue mood lighting, four lounge chairs that swivel so all passengers can face each other if they wanted, barn-style doors for a large entryway, six display panels, and button-free controls for everything (both touch and gestures are recognized). **It runs on a hybrid electric and fuel cell powertrain.**

Mercedes actually thinks they can realize a car like this by 2030, too. We don't know what to think, but we appreciate the audacity.

Parrot RNB 6

The latest aftermarket car dashboard from Parrot, the RNB 6 is a double-DIN head unit with 55 watts per four channel output, a 7-inch HD touchscreen, HDMI input for external video, on-board storage for multimedia content, satellite radio inputs, and, of course, AM/FM radio. The standout feature, though, is support for both **Android Auto and Carplay**, so you can equip your car with either state-of-the-art infotainment systems, depending on what phone you currently own.



Gogoro



The Taiwanese company showed off their all-electric Smartscooter, along with the plan for the network of battery-swapping kiosks that will power it. The vehicle itself is very impressive, with plenty of clever features, but the network itself is the really ambitious part. Instead of being plugged in for hours to recharge like conventional electric vehicles, the **Smartscooter uses swappable battery modules** that you can retrieve at Gogoro kiosks littered throughout the city, allowing you to get your scooter fully-charged in just a few seconds. If successful, this could pave the way electric vehicle battery-swapping stations that are just as ubiquitous as the gasoline stations we have now and that's a big deal.

Flyboard Air Sets New Hoverboard Distance Record

Count us among the skeptics when the first teaser for the Flyboard Air came out last month. Turns out, it's more real than any [hoverboard](#) we've seen before, as the darn thing just set the Guinness World Record for the furthest distance traveled on a hovering transporter.

According to Guinness, inventor Franky Zapata, who also made the original [Flyboard](#), rode the device a total of 7,388 feet – over 6,300 feet further than the previous record holder. And he did that while performing a clean landing, too, making things look really, really good for what appears to be humanity's greatest hope for a functional commercial hoverboard.

During the record-setting flight, Zapata flew the Flyboard Air 100 feet or so above the water off the coast of Sausset-les-Pins in the south of France, maneuvering it from the takeoff platform on Carry-le Rouet to the local port. It reached a reported top speed of 44 mph during the seven minute flight, although Zapata Racing claims that the device can actually hit up to 93 mph, as well as reach heights of up to 10,000 feet and stay airborne for up to 10 minutes in a single charge.

Unlike many hoverboard projects that attempt to mimic a skateboard form factor, the Flyboard Air actually looks more like Green Goblin's hovercraft. Still a work in progress, though, it doesn't appear to have much in the way of safety systems for now, which is why Zapata sticks to flying it over water, which should allow him to crash safely in the event of a malfunction.



Eco-Friendlier Private Jets

[Electric planes](#), as a concept, are great and all. The limitations of battery technology, however, make its viability more questionable than anything else. Simply put, you're going to have a lot less range than what a typical airplane can do. Despite that, there are upsides to electric flight that does make it somewhat attractive to a good load of folks. That, we're guessing, is what Eviation is counting for their Alice aircraft. An electric private plane, the aircraft should serve as a viable alternative to [private jets](#) for short-range flights, all while delivering the environmental benefits of all-electric transport. You know, reduced carbon footprint and all that good stuff, so you can travel by air without producing any emissions. That's right, you can live a baller lifestyle while still pretending to care about global warming. The Eviation Alice can accommodate nine passengers, along with two pilots, inside its unpressurized cabin, so it's big enough to serve as a reasonable alternative to most private jets for air travel. Equipped with a 980 kWh battery array, it has a maximum range of only 600 miles, which makes it more comparable to helicopters than other private planes as far as travel distance is concerned. Basically, you can use it for short-distance flights, such as when going from New York to Quebec or California to Utah, but anything further than that and you're going to need to make refueling arrangements. Or rather recharging. And, no, you cannot carry enough power banks to juice it enough to adequately extend the range. Despite the seemingly low range, it's actually quite impressive for an electric plane, considering how much power is required to get thing up in the air and send it propelling forward. To achieve that, Eviation relied on a purely-composite construction and uniquely-efficient airframe that shaved down the plane's weight considerably. According to the company, it allowed the plane to be 300 times more energy efficient than similarly-sized aircrafts.



A personal helicopter powered by rockets. That sounds awesome, right? I mean, that's like the same level as predator robots created by aliens who happen to be zombies dreaming a dream within a dream. The Dragonfly's description, of course, sounds much more menacing than it actually is - not that it isn't a pretty special rotorcraft all on its own.



Measuring a mere 8 inches long and weighing 1.5 pounds apiece, the dual-rocket engine setup is far from intimidating. But they do get the job done, pumping out 104 horsepower each to give the 230lb aircraft the necessary boost to fly you to high altitudes. The Dragonfly uses a two-bladed propeller, each one carrying a rocket right on its tip. When the rockets speed forward, the thrust pushes the rotor

to spin at up to 750RPM, whizzing about its business like any conventional whirlybird. It uses commercial-grade hydrogen peroxide solution (diluted to around 50 to 70 percent) to power the rockets, which consumes the liquid at a rate of 11 gallons per hour, allowing the chopper to fly a maximum of 90 minutes at a time. Created by Ricardo Cavalcanti, the personal flyer uses the two diminutive rockets to propel it at speeds of up to



14-Propeller All-Electric Plane

The **X-plane** has a long and esteemed history, starting with the inaugural experimental aircraft from 1947 that became the first to break the speed of sound. The innovation that's been synonymous with the designation continues with the agency's first X-plane in over a decade: the NASA X-57 Maxwell, the first one to rely exclusively on electric motors for power.



Designed to test more environmentally-sustainable propulsion technologies, the aircraft trades in the usual gas-fueled piston engines for 14 electric propellers, each of which is powered by its own electric motor. It marks the beginning of NASA's New Aviation Horizons program, a 10-year initiative that seeks to promote aviation technologies that reduce carbon emissions, fuel consumption, and noise pollution.

The NASA X-57 Maxwell will be built from a modified Tecnam P200GT light aircraft, whose wings and dual piston engines will be replaced with a pair of long skinny wings holding seven motorized propellers each. Six will be on the leading edge of each wing to handle takeoffs and landings, while a larger one will sit on each of the wing tips for use at cruise altitude. NASA believes the design will cause a significant reduction in the energy required for private planes to cruise at 175 mph as well as entail lower operational



be

Roll Bars To Prevent Capsizing

Whitewater rafting is fun. Once you start playing around on Class 4 or higher waves, however, things take on an entirely different turn. Simply put, it becomes a genuinely life-threatening endeavor. Creature Craft is a relatively new class of whitewater rafts designed to make your experience just a little safer.

A raft that will never capsize, it's equipped with a patented roll cage design that allows the boat to sit on its side instead of turning over completely, allowing you to easily roll it into an upright position. According to the outfit, it can even be done with everyone staying seated on the boat – just have everybody shift their weight accordingly to force the raft to return to its desired orientation.

We know, you're supposed to fall off anyway when a raft



turns on its

side. Well, the Creature Craft deftly avoids leaving you that same fate by coming with integrated straps that you can secure around your thighs, while a quick release system allows a paddler to get themselves on the water, in case the raft won't turn without getting an outside nudge. They offer seven models of whitewater rafts, which come in varying sizes to accommodate your individual needs. Each one features rigid carry handles, self-bailing floors, convertible tops, and urethane coating, with optional passenger seat frames, expedition urethane wraps, and additional paddle seats.

Available now, the Creature Craft is priced starting at \$4,995.

Neyk Luxury Submarine Bills

Most **submersibles** designed to hold over a dozen people are designed to function as military warships, with recreational versions usually having room for three or four people max. Not the Neyk Luxury Submarine, which can be equipped to ferry up to 20 people underwater.

Billed as “the most maneuverable submarine in the world,” the teardrop-shaped submersible boasts easy operation, ensuring novices can take control of the watercraft with nothing but a small amount of training. That way, dodging underwater structures, sunken ships, and giant whales in repose won't have to be a daunting challenge, allowing you to actually enjoy your time exploring underwater locations. The Neyk Luxury Submarine measures 64 x 23 x 18 feet (length x width x height), with a 10-foot hull diameter that leave the space inside feel similar to a private jet's cabin. Designed to operate at depths of up to 500 feet, the sub can both drive forward at satisfying speeds as well as hover in place using vertical thrusters on the dome, allowing passengers to enjoy the available sights for extended periods of time. It can be equipped with seats for up to 20 people, although only six seats can be installed in the windowed passenger section (so the rest won't be able to enjoy the sights). Features include up to 150 hours of life support for a dozen passengers, built-in air-conditioning, and up to eight tons of payload. It can run at speeds of up to 11 knots on the surface, as well as 15 knots when submerged in the water.



Solowheel, A 20-Lb. Unicycle You Can Carry Like A Bag

Segway too big for you? The Solowheel, a standing unicycle that can be carried like a small bag, might prove a bit more to your liking.

Created by Inventist, the personal mobility transporter has the dimensions of a single bicycle wheel, so there's no need to find plenty of space for it when not in use (under your desk, right next to the desktop case will do). There's a handle up top, too, so you can dismount and carry it like a 20-lb. traveling suitcase (very useful when you need to walk a flight of stairs).



The Solowheel is a **self-balancing unicycle** that uses gyroscopes to keep you upright the entire time. You ride it by folding out the foot platforms on either side, mounting them and using leaning movements to direct operation -- forwards increases speed, backwards slows it down, left and right controls direction.

A 1,000-watt lithium-ion battery provides juice to the assembly, allowing you to ride for up to 12 miles on a single charge

(around two hours at moderate speeds). Recharging the battery takes an estimated 45 minutes, so you can easily plug in at work to get your unicycle ready for the trip home later. Oh yeah, the battery gets extra trickles, too, when you ride downhill or slow down.

The built-in motor can propel the Solowheel at top speeds of 12 mph. While that's not exactly "blistering," it does allow you to get around without having to walk like the rest of humanity. Which happens to be awesome. No word on availability, but they're pegging it at a \$1,500 price point. Not bad.

Kitty Hawk Flyer Is A Flying Car For Lakes And Rivers

No, the **flying cars of our immediate future** aren't likely to look like the ones science fiction envisioned many decades ago. Instead, they're more likely to look like your good, old consumer drone. Or, if the Kitty Hawk Flyer has its way, a vehicle that looks like something someone from the Star Wars universe cobbled together from an intergalactic junkyard.

Unlike the flying cars we fantasized about, this one can't actually ride on roads and then launch to the skies at the push of a button. Instead, it's a first-generation flying car that's intended more as a recreational vehicle than an actual commuting machine.



- ◆ Around a 100 million years ago, India was an island.
- ◆ The world's largest producer of milk
- ◆ The first country to consume sugar
- ◆ The highest cricket ground in the world
- ◆ Shampooing is an Indian concept
- ◆ The Indian national Kabaddi team has won all World Cups
- ◆ Water on the moon was discovered by India's ISRO Chandrayaan- 1
- ◆ Science day in Switzerland is dedicated to Ex-Indian President, APJ Abdul Kalam
- ◆ India is the world's second-largest English speaking country Largest number of vegetarians in the world are Indians.
- ◆ Diamonds were first mined in India
- ◆ India has the world's third largest active army, after China and USA.
- ◆ Tirupati Balaji temple and Kashi Vishwanath Temple both, receive more visitors than the Vatican City and Mecca combined.

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VISION

To empower the field of Mechanical Engineering to contribute to the development of industrial economy and welfare of humanity.

MISSION

- ◆ To achieve quality education by means of state-of-the-art infrastructure
- ◆ To establish industry-institute interaction to widen the scope for research and development
- ◆ To promote self employment through entrepreneurship and leadership qualities
- ◆ To develop team spirit and values for social well being

PROGRAMME EDUCATIONAL OBJECTIVES

PEO1: Graduates will excel in professional career and compete globally to pursue higher education in the field of Mechanical Engineering

PEO2: Graduates will demonstrate core competency in solving complex Mechanical Engineering problems

PEO3: Graduates will engage in continuous professional development through constantly evolving technology for the industrial needs

PEO4: Graduates will emerge as successful entrepreneurs through innovations upholding the ethical values of society



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