



Enlightening Wisdom

# The Differential

Mechanical Engineering Department  
Acropolis Institute of Technology and Research,  
Indore

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## Affiliations



SAEINDIA



ISHRAE

Each teacher once was a student,  
Every winner once was a loser,  
Every expert once was a beginner,  
But all of them have crossed the bridge called  
'Learning'

## Vision

To be a place where the quality education, research and outreach programs synergise for the benefit of society through Mechanical Engineering.

## Mission

To produce leaders in the Mechanical Engineering profession who are strong in fundamentals and new technologies; practical oriented, value driven, well groomed technocrat and professional.

## About the Newsletter...



Prof. Tapan Jain

The Differential for a mechanical engineer is a design to drive a pair of wheels while allowing them to rotate at different speeds, and so is the human life, depending on a 'difference'; varying according to the circumstances or relevant factors. This is where **The Differential** brings you all the differences that a mechanical engineer makes in lives of all. The gears of differential churns to develop and transmit the most inventive thoughts in mind box of an engineer, which creates almost everything we see unnatural tangible on earth. I hope that

**The Differential** will be a powered media to e-spread the Tech-articles, Tech-news Tech-events and cultural news. The Newsletter is a departmental leap in endeavoring programmable print presentation through  $\text{\LaTeX}$  and using hypertext search of content

## Head speaks...

It gives me great pleasure to give best wishes for **The Differential**, newsletter from Mechanical Engineering Department. The students and faculties of department are always proactive in taking initiatives in technical, cultural and social events. I hope that this newsletter will serve the purpose of reflecting all the activities of department and it will inspire other to do their best. I wish every reader a very prosperous and happy New Year.



Dr. Manoj Modi

## From Editor's Desk...

On behalf of the Editorial Team of our newsletter, I would like to wish all a very Happy, Harmonious, and Prosperous New Year 2018! The issue has a lot of interesting Departmental news which will tell you how our quiet looking department is always a buzz with activity underneath. It is the efficiency of our students and staff that so many activities of different flavours keep taking place and yet the schedules and daily routine don't get disturbed. I hope you enjoy going through the newsletter and will also send us your opinions and suggestions to improve it further.



Prof. Saurabh Jain

## An Edge Near To Errorless Industry: Lean Six Sigma Green Belt Certification Workshop

The Department of Mechanical Engineering, Acropolis Institute Of Technology And Research conducted a workshop on 'Lean Six Sigma Green Belt Certification' for students and faculty members. Mr. Vishwadeep Khatri, founder and director of 'Benchmark Six Sigma' was the speaker and trainer of the event which started on 1st of November, 2017 and ended on 3rd of November, 2017. Shri Rajendra Sigh Jain, Managing Director, ITL Industries Indore along with Dr. Shamsher Singh, Vice Chairman Academics was the chief guest. The Valedictory ceremony was graced by the address of Shri Rajendra Joshi, Executive Vice President, AVTEC Ltd. and Dr. S.C. Sharma, Director, AITR, also the event witnessed esteemed presence of Dr. Manoj Modi, HoD Mechanical Engineering, as Convener and Dr.

S.K. Sohani, Hod, Civil Engineering. The total participation was 68, in which 8 were faculty member, rest were students of 2nd , 3rd and final year.

The credit of success also goes to Prof. Nitin Rathi who played the role of Coordinator with Prof. Himanshu Bhiwarpurkar and Prof. Umesh Carpenter as Co-coordinators. The objective of this workshop was to provide Lean Six Sigma Green Belt training to students. Completion of this training would provide students the skilled set of knowledge and methodology with tools and skills so that they can apply them in their work place for the ultimate errorless result. This would also prepare them to look at business problem resolution of real world.

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## Dr. Shankar Venugopal, VP, Mahindra and Mahindra, speaks

Expert Speaker Dr. Shankar Venugopal Vice President, [Mahindra and Mahindra] delivered the expert lecture on 'Recent Trends in Automobile'. He discussed his views on the implementation of new technologies in Automobile industries like zero emission, zero accident and zero traffic cognition. He also discussed about the solar PV development and uses of Lidar which was earlier produced in \$75000 that is now reduced to \$1000 and targeted for \$250 which will help in zero accident. This is an extraordinary effect in the automotive industry, which will reduce the cost of new technology in exponential way, i.e. new developed automobiles will be cheaper in future. Olli (Watson IOT connected car) 90% 3D printed driverless car was highlighted by him as the outcome of all three above mentioned technologies, he added 'this type of self driv-



Dr. Shankar Venugopal

ing car will reduce car traffic by 80%'. Furthermore, he explained the fundamental shift in Automobile Industry, that internal combustion engine being replaced by electric motor for motion of vehicle. For which he used the example of Tesla car. To make electric motor more efficient he elucidated the use of various material. He emphasised the attention on the requirement of magnet less motors. In his words of Wisdom Dr.Venugopal quoted 'to manufacture a car 14800 liter water is required' to enlighten the house about the necessity to reduce water consumption in manufacturing industry.

In last, he shared his vision of the future of automotive technology specifically about electric vehicle from Lithium-Ion battery to no battery, and connected vehicles from remote monitoring to vehicle to vehicle active communication and automotive vehicles for off highway application with fully autonomous vehicles in the city.

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## Department fabricates EV for E-BAJA 2018

Acropolis Institute of Technology & Research, Indore participated in 'BAJA SAEINDIA 2018' event held from 25th January to 28th January, 2018 at National Automotive testing tracks (NATRAX), Pithampur. The design of the eBAJA ATV parts and assembly was carried out along with the analysis on CAD/ CAE tools available in house. The entire design was analysed for failures as per the constraints of the rule book. The styling and designing



was carried out using Creo-2 / CATIA and analysis tool ANSYS. The AITR team (named Acrostreak) ranked 11th All India and 1st in State in Virtual Round.

This was the first time when the department has endeavored in development of an Electric vehicle. It was interdisciplinary event where the team consisted of both Mechanical and Electronics students. The team successfully cleared all the Electrical and Mechanical test and static events under stringent checks of BJA officials. After successful dynamic test like brakes etc., the vehicle was put for Endurance test. The styling and fabrication was appreciated by officials. The event has given a good insight of core knowledge in mechanical and electrical engineering to the students.

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## 3-D Printed Prosthetics-A Boon to Specially-Abled

Forged through the mixing of high-tech fabrication and old-fashioned mechanical tinkering, a carpenter and a self-described "mechanical effects artist" have combined efforts to provide low-cost, low-tech mechanical fingers for those people lacking them. Called RoboHand, the device is made of thermosplastic fabricated on a 3-D printer and operated using what is basically a pulley-and-cable system. Its inventors, South African carpenter Richard Van As and Ivan



Owen, from Bellevue, WA, have fitted about 170 people, many of them children, with a RoboHand since they began mastering 3-D printing at the beginning of this year. The inventors have produced them at cost, paid for through donations, allowing clients to avoid paying thousands of dollars for prosthetics such as a myoelectric hand, which works using a muscle's electric impulse to move an artificial limb. Experts believe that 3D printing can help 30 million and more to get prosthetic help. This is a relieving assurance in order to achieve the world with no individual who legs behind due to any kind of physical uniqueness. Initially this idea seemed like a straight science fiction, but the engineers and researcher made it possible. Well the technology never stands still the vibrant minds are still working to attain the best possible.

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## Technical Training : Altair Hypermesh

Under Technical Skill Development Training Program Mechanical Engineering department organised "Training on Altair Hypermesh" in the month of Oct- 2017 for BE III year V semester Mechanical engineering students. The software is used for designing and optimization of machine components. It was an advance training subsequent to modelling on CREO which had already been conducted

in previous semester. The training was beneficial, as it helped students to improve their technical and analytical skill. Moreover it turned out to be a blessing for BAJA team as it helped them in analysis of vehicle structure, endurance and aesthetics.

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## Industry Visits: An exposure to real world

Department of Mechanical Engineering organized Industrial visits to various leading manufacturing units for BE and Diploma Mechanical Engineering students in order to bridge the gap of theory and practical exposure. Our students visited various Industries, which gave greater clarity about various production and management concepts, as they could practically see how these concepts were put into action.

Name of Some Industries Visited:

- VOLVO-EICHER PITHAMPUR
- BRIDGESTONE INDIA

- GAJRA GEARS DEWAS
- IGTR MSME INDORE
- CAPARO ENGINEERING INDIA PVT. LTD.,DEWAS
- PS CAMSHAFT PVT. LTD,PITHAMPUR
- HD WIRES PVT. LTD.,INDORE
- INDIRA SAGAR HYDRO POWER PLANT PUNASA
- INDO TOOLING PVT LTD
- ITL INDUSTRIES LTD.
- SANCHI DAIRY PLANT,INDORE
- CUMMINS TURBO TECHNOLOGIES,PITHAMPUR
- KIRLOSKER BROTHERS PVT. LTD.,DEWAS

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## Young Researcher on "The Future of Hydrogen Engine"

MR. Saurabh Kumar Singh of 3rd year 5th semester got his research paper published in "International Journal of Science and Research" on the topic 'Use of Magnesium Hydride as Hydrogen Storage Material in Running Cars'. This research paper suggests the use of hydrogen efficiently in vehicles and analyzes the amount of hydrogen that can be stored in it and the amount of power that can be developed through it. Previous research performed only suggests use of hydrogen



in vehicles but not about its storage and utilization. 1 gal (10 kg) of MgH<sub>2</sub> can produce 30.126 KWh. The power produced by 1 gal of MgH<sub>2</sub> is less than that produced by 1 gal diesel but the use of MgH<sub>2</sub> is a step forward towards the use of sustainable resources. Also the use of hydrogen as a fuel does not have adverse effect on environment which fossil fuels have such as air-pollution. Using MgH<sub>2</sub> as hydrogen storage material is economical and is viable and also for the betterment of our environment and upcoming generations, we can compromise with the slight lag in power.

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## Student Achievements

1. Mr. Mayank Dwivedi & Mr. Mayank Sen Students of Mechanical Engg. department won gold medal in ROBO war competition held at IIT Delhi annual techfest, ESYA 2017 held in the month of Aug. 2017.
2. Mr. Mayank Dwivedi & Mr. Mayank Sen students of mechanical Engg. department won silver medal in Tehfest held at SVPPC Bhopal.
3. Mr. Prabhanshu Sharma and team secured first position in group dance competition NAACH organized by DAVV Indore.
4. Mr. Mitank Dashondi has successfully completed, "Understanding Einstein: The Special Theory of Relativity" through Coursera by Stanford University, USA on 24th June 2017.
5. Mr. Madhav Prasad Yadav, Mr. Parth Trivedi and MR. Jaspreet Singh successfully completed the course "Innovation management" and Intellectual property-101(Lawcubator Technologies)
6. Mr. Ayush Singh Songara attended Entrepreneurship awareness camp sponsored by NSTEDB DST(Govt. of India), organised by SRLJAN Ahmadabad on 20-22 Sep. 2017.
7. Mr. Ayush Singh Songara participated in two days workshop on design thinking held on May 4-5 2017 organised by IPPC AITR
8. Mr. Atharv Purohit started a start-up named 'Buz-znomad' and won Rs. 10000 cash prize.
9. 60 Students of Mechanical Engg. Department achieved/participated in the certification course, lean six sigma green belt by Benchmark 6-sigma.
10. Mr. Jyoti Prakash Roy participated in inter collegiate nodal level athletics meet 2017-18 from 2-4 Nov 2017 at JIT BORAWAN.

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## Faculty Achievements

1. Prof. Tapan Jain got his research paper published with Dr. N Kumar on "Investigation on Energy Absorption characteristics of a car bumper and truck RUPD under crash impact" in "International Journal of Engineering and Technology, Vol.9, No.5, Pg. 3828 – 3835, 2017.
2. Prof. Himanshu Bhiwapurkar became registered Research Scholar from DAVV.
3. Prof. Saurabh Jain has attended FDP on Additive manufacturing at Symbiosis university of applied science .
4. Prof. Nitin Rathi has attended FDP on Additive manufacturing at Symbiosis university of applied science on.
5. Prof. Nitin Rathi, Prof, Saurabh Jain, Prof. Himanshu Bhiwapurkar, Dr. Vinayak Vishwakarma, Prof. Umesh Carpenter achieved Green belt certification on six sigma from benchmark6 sigma.
6. Dr. Manoj Modi and Prof. Umesh Bhatia participated in the course lean six sigma green belt by benchmark6 sigma.
7. Prof. Umesh Carpenter awarded as "faculty of the year" for session 2016-17 under chairman award AITR.
8. Prof. Rajeev Gupta has participated in training of trainer program and scored 80% in the domain of job dealership telecaller sales executive ASC/Q1011NSQF level 4.

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