

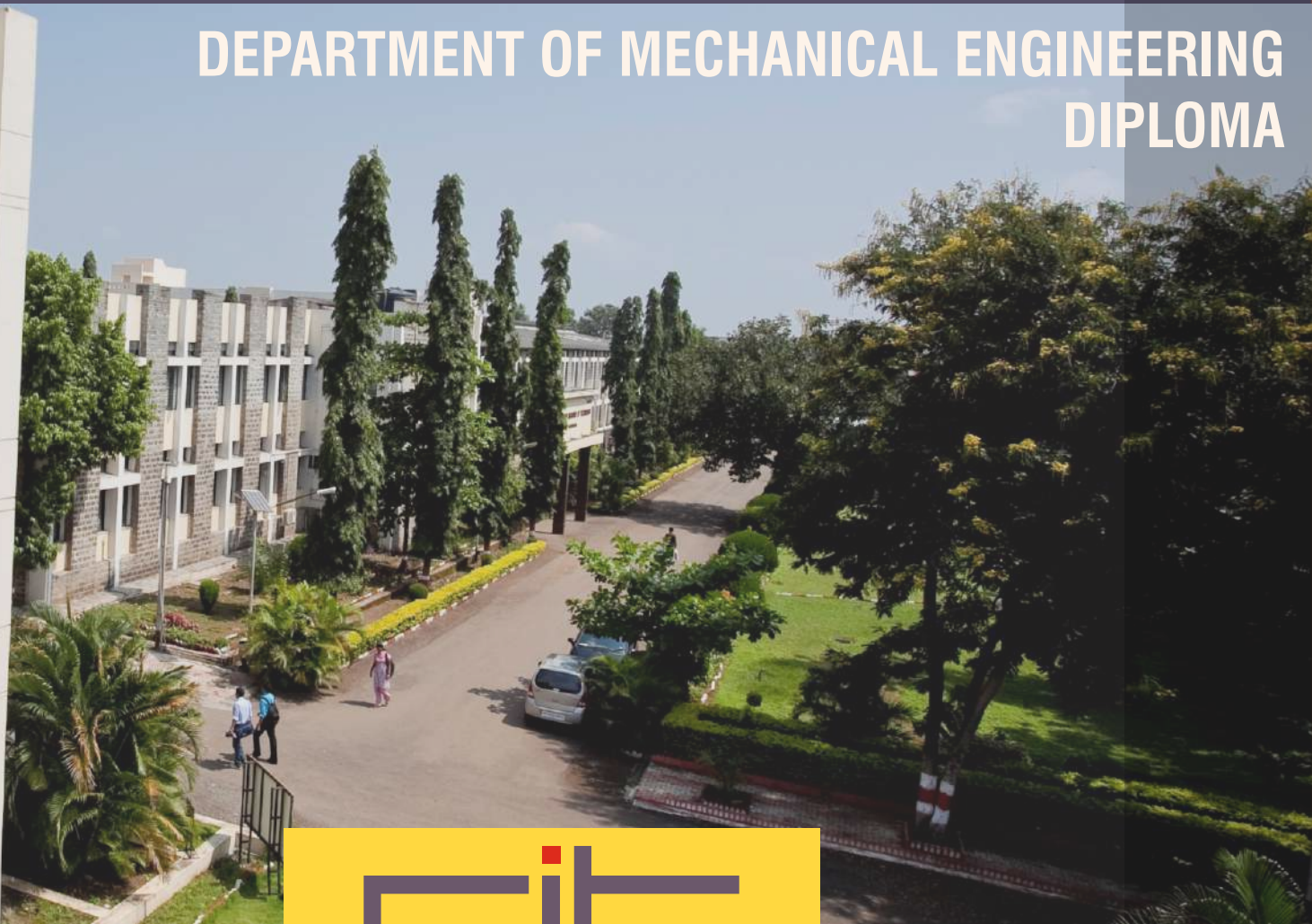
# MECHANICUS

AN ANNUAL PUBLICATION

ISSUE 5

JUNE 2019 - MAY 2020

## DEPARTMENT OF MECHANICAL ENGINEERING DIPLOMA



RAJARAMBAPU INSTITUTE OF TECHNOLOGY

An Autonomus Institute  
Accredited with "A" Grade  
by NAAC, UGC



**100%**  
Placemets



**EXCELLENT**

Grade by  
M.S.B.T.E.'s  
E.A.M.C.  
For AY 2019-20



**DISTINGUISHED**

Young Teacher Award  
Secured by  
02 Mechanical Faculties  
for A. Y. 2019-20





## EDITOR'S DESK



It is a matter of great pride and privilege for me being a part of Departmental Newsletter "Mechanicus 2019-20". Department of Mechanical Engineering provide a platform for every students to develop their learning skill. The main thrust of the Department has been to achieve human excellence to shape the personality of pupils through host of extracurricular and co curricular activities and instilling in them the moral values.

**Mr. Swapnil D. Gaikwad**  
Lecturer  
Department of Mechanical Engineering

### Department Vision

To become a center of excellence in the field of Mechanical Engineering, producing innovative and creative Mechanical Engineers to meet the ever changing industrial demands and social needs.

### Department Mission

- To empower the students with technical knowledge in Mechanical Engineering.
- To encourage students for higher studies in recognized institutes.
- To enrich students with sound skill sets through effective interaction with industries, entrepreneurs and alumni
- To develop ethical & professional values among students with societal and environmental concern.

### Editorial Board

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Prof. A. A. Mulla, Lecturer

Mr. Suraj Chavan, Student Representative, (S.Y. Mechanical)

Mr. Yogesh Desai, Student Representative, (T.Y. Mechanical)



### Program Education Objectives (PEO's)

PEO-01 : Provide socially responsible, environment friendly solutions to Mechanical engineering related broad-based problems adapting professional ethics.

PEO-02 : Adapt state-of-the-art Mechanical engineering broad-based technologies to work in Multidisciplinary work environments.

PEO-03 : Solve broad-based problems individually and as a team member communicating effectively in the world of work.

### Programme Outcomes (PO's)

- PO 1** Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
- PO 2** Problem analysis: Identify and analyse well-defined engineering problems using codified standard methods.
- PO 3** Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
- PO 4** Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
- PO 5** Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices.
- PO 6** Project Management: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
- PO 7** Life-long learning: Ability to analyse individual needs and engage in updating in the context of technological changes.

### Program Specific Outcomes (PSO's)

- PSO 1** Modern Software Usage: Use latest Mechanical engineering related softwares for simple design, drafting, manufacturing, maintenance and documentation of mechanical engineering components and processes.
- PSO 2** Equipment and Instruments: Maintain equipment and instruments related to Mechanical Engineering.
- PSO 3** Mechanical Engineering Processes: Manage Mechanical engineering processes by selecting and scheduling relevant equipment, substrates, quality control techniques and operational parameters.

A number of programs like Guest Lectures, Industrial visits and training workshop from various Institutional, Organization and Industrial Experts in the field were organized by department for in depth understand-ing of the subjects.

## EXPERT TALK



Expert Lecture by Mr. Mahesh H. Bhujabal, Quality Surveyor, Kirloskar Brothers Ltd. Kirloskarwadi on "Pumps, Actuators & Valves used in fluid operated Systems"



Expert Lecture by Mr. Swapnil Sunil Bhandwale, Assistant Engi-neer, Production Planning Dept., Kirloskar Brothers Ltd., Kirloskarwadi on "Shear Force Diagram & Bending Moment Diagram"



Expert Lecture by Mr. M.B.Takare, Design Engineer, Jagdish Iron & Steels Pvt. Ltd. MIDC, Miraj on "Design of Spring & Power Screw"



Expert Lecture by Adv. Suraj Suresh Nalawade, B.S.L. L.L.B. Islampur on "Environmental Protection & Prevention Acts"

# CONFLUENCE WITH INDUSTRIES



Industrial visit to Rajarambapu Co-Operative  
Sugar Factory, Rajaramnagar



Industrial visit to Perfect Pressings,  
Hajarmachi ,Ogalewadi MIDC , Karad



Industrial visit to Dytech Engineers Pvt. Ltd.  
,Ogalewadi MIDC , Karad



Industrial visit to CSIR- National Institute of  
Oceanography, Dona –Poula, Goa

# STUDENT CENTRED ACTIVITIES



Black Day on the occasion  
of *Makar Sankranti*



Tree Plantation on  
15<sup>th</sup> August, 2019



*Katha-Kathan* Program on the occasion of  
*Marathi Rajbhasha Din*



*Marathi Rajbhasha Din*  
Celebration



Engineer's Day Celebration



Blood Donation Camp on the occasion of  
Late Rajarambapur Patil's 100th Birth Anniversary

# STUDENT CENTRED ACTIVITIES



Mechanical Department welcomed new faces of Diploma First Year & Direct Second Year Students. Academic Year 2019-2020.



State-Level Technical Events "Poster Presentation"



State-Level Technical Events "Isomecher"



Celebrating "Gurupornima"



Cleaning Up residences after Flood

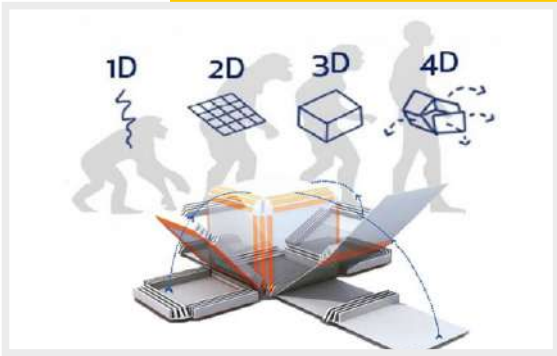
# 4D PRINTING TECHNOLOGY

As additive manufacturing technology moves from research and prototyping to mainstream production, researchers are shifting their attention to producing structures that can transform in a pre-programmed way in response to a stimulus. The technology needed to create such products has been given the popular name "4D printing," because it creates 3D objects that transform over time.

The head of MIT's Self-Assembly Laboratory, Skylar Tibbits, pioneered today's wave of 4D printing research a few years ago with expanding materials and simple deformations. A collaboration involving researchers from MIT's Camera Culture group and those in the Self-Assembly Laboratory with the companies Stratasys and Autodesk took this method further.

Their approach was to print 3D structures combining materials with different properties: one that remained rigid and another that expanded up to 200% of its original volume. The expanding materials were placed strategically on the main structure to produce joints that stretched and folded like a "bendy straw" when activated by water, forming a broad range of shapes. For example, one 3D-printed shape resembled the initials "MIT," but was designed to transform into another formation that looks like the initials "SAL," which stand for Self-Assembly Laboratory.

Today, 4D printing is emerging as a further extension of additive manufacturing that has real commercial applications. According to analysts at Grandview Research, the global 4D printing market is only estimated to reach \$64.5 million by 2019, but from there, it's expected to grow at a compound annual growth rate exceeding 33.2 percent through 2025. The research firm attributes the rapid take-off to rising demand in the defense, aerospace, automotive, and healthcare industries.





# ZERO CARBON NATURAL GAS

Natural Gas is an energy source that is cheap, and the world has lots of it. It's also a highly scalable energy fuel base. It currently accounts for more than 30 percent of US electricity and 22 per cent of world electricity.

The problem is, to process it for electricity, the most basic natural gas-fired turbines generates massive carbon emissions which are the major cause of the greenhouse effect.

Naturally, there is a global drive for the health of the planet to reduce those carbon emissions. The good news is there's couple of technologies currently being tested that can produce zero carbon natural gas. Each technology uses existing tech systems to create a revolutionary means of handling carbon. The first one is being tested by a company called NET Power in the United States. The plant actually burns natural gas but reproduces the CO<sub>2</sub> into what is called a supercritical CO<sub>2</sub> which is then used to drive a specially built turbine in a continuous and self-sustaining cycle.

The second technology developed by MIT's professor of chemical engineering, Paul Barton and postdoctoral associate Thomas Adams, promotes a system that is distinctive because it produces power from natural gas without actually burning it! The waste products of this system are clean water and almost pure carbon dioxide. The CO<sub>2</sub> can then be reproduced for other uses.

There's been environmental resistance to build more natural gas power plants and pipelines to transport it. With the new technologies of producing zero carbon natural gas, we'll likely see a much-needed expansion of plants and pipelines that will help bring down the cost of fuel for everyone on the planet.

Cheap energy is a must for personal economic growth. Let's hope zero carbon natural gas can help promote that opportunity for millions of global citizens.



Dipti Patil  
(SY Mechanical)  
1876009



**ZERO  
CARBON  
FOOTPRINT**



**ZERO  
CARBON**



RAJARAMBAPU INSTITUTE OF TECHNOLOGY

## NEW HEATING CONCEPT INCREASE EV RANGE & ENHANCE PASSENGER COMFORT

Heating an EV passenger compartment requires additional energy, which sometimes reduces the vehicle's range. Engineering specialist IAV teamed up with Louisenthal, a manufacturer of banknote substrates, security papers and security foils, to develop an energy-efficient heating concept that requires considerably less energy while increasing comfort for drivers and passengers. At the heart of the heating concept is a thin, cost-effective and easy-to-process foil from Louisenthal. The SmartMesh foil has a mesh of conductive tracks on its surface. The foil is integrated into the doors, center console and roof lining. On applying the operating voltage, it warms up and radiates heat into the passenger compartment. The heating foil is transparent, which means it can be combined with ambient lighting or LED design elements. The foils are integrated into the vehicle alongside the standard heating system.

IAV simulated the use of the foil in vehicle trims with 3D CFD software and, using a demonstrator, has shown how it works on a car door interior trim. Simulation results demonstrate that a comfortable climate in the passenger compartment can be achieved for the driver and passengers in less time at low outside temperatures, thanks to the additional integrated heating foils. After the heating-up phase, the total amount of energy required for heating the passenger compartment can be reduced by up to 20 percent as a result of the foil's radiant heat. This can increase the vehicle's range by up to 6 percent.



Suraj Chavan  
(SY Mechanical)  
1876030

**RESEARCH & PUBLICATION  
TRAINING/WORKSHOP/SEMINAR/CONFERENCE**

Sr. No.	Name of the Faculty	Title of the Paper	National/International
01	Mr. Ansar Allauddin Mulla	Modelling neutral gear rattle for a light commercial vehicle.	International
02	Mr. Ansar Allauddin Mulla	Investigating Performance of Quarter-Car Semi-Active Suspension with Skyhook, Fuzzy Logic, Adaptive Neuro-Fuzzy Inference System Control Strategies for ISO-Classified Road Disturbance.	International
03	Mr. Nilesh Chandrakant Gaikwad	Enhancing of Learning Outcomes by Using Active Learning Techniques for engineering Graphics Course.	International
04	Mr. Nilesh Chandrakant Gaikwad	A Review Paper on Ice Melting Road.	International
05	Mr. Jayant Jaysing Pharne	Enhancement of Learning outcomes by Using Active Learning Technique for Engineering Graphics course.	International
06	Mr. Swapnil Hanmant Patil	Design & Fabrication of blue tooth controlled robotic floor cleaning machine.	International
07	Mr. Swapnil Hanmant Patil	Enhancement of Learning outcomes by Using Active Learning Technique for Engineering Graphics course.	International
08	Mr. Swapnil Dilip Gaikwad	Development and Fabrication of CVT operated vehicle	International

Sr. No.	Name of the Faculty	Module Description	Contributing Host
01	Mr. V. B. Choudhari	Outcome Based education a step towards excellence	GCOE, Karad
02	Mr. Nilesh C. Gaikwad	Introduction to Ansys Workbench	ENTUPLE Technologies
03	Mr. Nilesh C. Gaikwad	Research Technique and Challenge	Shivajirao S. Jondhle Polytechnic, Asangaon
04	Mr. Nilesh C. Gaikwad	Faculty Awareness Programme on NBA Accreditation	Bhagwant Institute of Technology
05	Mr. Nilesh C. Gaikwad	Research Paper Writing & Intellectual Property Rights	RIT, Rajaramnagar
06	Mr. Swapnil.D. Gaikwad	Outcome based Education Delivery Learning & Evaluation	MSBTE
07	Mr. Swapnil.D. Gaikwad	Introduction to Ansys Workbench	ENTUPLE Technologies
08	Mr. Ansar A. Mulla	Computational Tools & techniques: MATLAB, ANSYS	GCOE, Karad
09	Mr. Jayant J. Pharne	Outcome Based education & NBA accreditation Process	RIT, Rajaramnagar
10	Mr. Jayant J. Pharne	Online Platforms for Distance Education	RIT, Rajaramnagar
11	Mr. Jayant J. Pharne	NBA Norms and preparation of SAR: Criteria 1 to 9	RIT, Rajaramnagar

# DEPARTMENT ACHIEVEMENTS

## DISTINGUISHED YOUNG TEACHER AWARD 2019-20



Prof. Amey P. Gaurvadkar  
Lecturer, Dept. of Mech. Engg.



Prof. Jayant J. Pharne  
Lecturer, Dept. of Mech. Engg.

“Suvarna Lakshya National Sport award”  
by Major Dhyanchand Central  
Sports Conference, India



Mr. Amit Pravin Bhosale  
National Skating Player

CONGRATULATIONS

## Academic Toppers

	Rank	Name of Student	Percentage
FIRST YEAR	01	Mr. Vishwajeet V. Patil	87.20 %
	02	Mr. Shriman Z. Patil	85.84 %
	03	Mr. Hrushikesh D. Patil	81.87 %
	Rank	Name of Student	Percentage
SECOND YEAR	01	Mr. Nikhil P. Shendage	89.15 %
	02	Mr. Suraj B. Chavan	86.60 %
	03	Ms. Shruti C. Pardeshi	85.48 %
	Rank	Name of Student	Percentage
THIRD YEAR	01	Mr. Rajatkumar R. Pawar	93.90 %
	02	Mr. Shreyas R. Mulik	92.36 %
	03	Mr. Aniket D. Patil	92.05 %