



SANDIP FOUNDATION'S  
SANDIP INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE ,  
NASHIK  
DEPARTMENT OF MECHANICAL ENGINEERING  
E-BULLETIN

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Vision of siTRC

To be acclaimed  
Institution for  
learning and research

Mission of siTRC

To impart in-depth technical  
knowledge.

To create conducive  
environment for research,  
innovation and  
entrepreneurship.

To instill the social and  
cultural values.



### From the HoD's Desk

I am happy to learn that Mechanical Engineering Department, Sandip Institute of Technology and research Centre is coming out with the quarterly departmental E-Bulletin. This E-Bulletin will help to share the news, events achievements of the department among alumni. This E-Bulletin will provide an opportunity for the staff and students to showcase their talents in technical writing. I would like to appreciate and congratulate editorial team of the department for their unrelenting efforts in compiling this E-Bulletin.

### From the editor's desk

It gives us an immense pleasure to introduce this E-bulletin of Mechanical Engineering Department. Proper communication plays a vital role in institution's development. This E-bulletin will serve to reinforce and allow increased awareness, improved interaction and integration among all of us. This E-bulletin will be a medium to provide proper acknowledgement and respect all of these efforts and its results.

## VISION OF THE DEPARTMENT

To achieve excellence in the domain of Mechanical Engineering by inculcating a culture of learning and research.

## MISSION OF THE DEPARTMENT

- To nurture the students of Mechanical Engineering to be competent, motivated and ethical professionals.
- To foster research, innovation and entrepreneurship skills leading to employable and self-reliant technocrats.
- To groom the socio-techno potential for up-liftment of society.

## PROGRAMME EDUCATIONAL OBJECTIVES (PEO'S)

- PEO 1: To pursue and establish the career in Mechanical Engineering.
- PEO 2: To demonstrate personal growth by pursuing higher studies, professional development course and/or engineering certifications.
- PEO 3: To inculcate entrepreneurship skills and nurture the ethics in the domain.

## PROGRAMME OUTCOMES

1. **Engineering Knowledge** – Apply knowledge of mathematics, science and engineering to solve the real life problems in Mechanical systems. An ability to analyze and interpret data.
2. **Problem Analysis** – Identify, formulate and solve Mechanical Engineering problems in thermal, manufacturing and machine design and conduct new experiments.
3. **Design/development of Solutions** – Design systems like thermal, robotics, mechatronics and machines within realistic constraints.
4. **Conduct investigations of complex problems** – Design and conduct experiments to interpret data and analyse the results.
5. **Modern Tool Usage** – To develop awareness and work on emerging technologies like CAD/CAM software's, Robotics.
6. **The engineer and society** – Understand the impact of an engineer in general and Mechanical Engineering knowledge for welfare of society in particular.
7. **Environment and Sustainability** – Develop or modify eco-friendly and highly reliable as well as sustainable systems.
8. **Ethics** – Take professional decision with a sense of ethical responsibility.
9. **Individual and team work** – Function effectively as an individual and as a member or leader in multidisciplinary and/or cross cultural teams.
10. **Communication** – Communicate effectively for achievements of goals.
11. **Project Management and Finance** – Execute disciplinary and interdisciplinary projects in day-to-day life.
12. **Life-Long Learning** – Imbibe habit of lifelong learning.

## ABOUT THE DEPARTMENT

The department is having highly qualified, experienced & motivated faculty members. The department has laboratories with latest testing facilities like multifuel VCR engine, computerized UTM (capacity 100 tonnes), computerized diesel engine test rig & exhaust gas analyzer for Engines. The CAD Centre of the department armed with latest hardware & software like Pro-E wildfire-5, ANSYS, Hypermesh, Mastercam, and AutoCAD etc. Department also have MOU with Altair Engg. Corporation (India) for conducting training on HyperMesh, Radioss (Linear), HyperForm, HyperCrash etc. The strength of department enables to offer the consultancy in all fields related to Mechanical Engineering.

**Professor and Head**

### Departmental activities

#### **Industrial Visit to Vaitarana Hydro Electric Power Plant**

Third year Mechanical Engineering students visited the Hydro Power Plant on 31<sup>st</sup> March 2017. The Vaitarana Power Station is located at Vaitarana dam on Vaitarana River in Nasik District. There is one unit of hydro turbine of 60 MW. The Unit is installed by Bharat Heavy Electrical Limited (BHEL). Students observed the working of reaction (Francis) turbine and understood the process of the generation of Electrical Energy. Students also learn about the control panel working.



## **A State Level Workshop on “Design of Experiments”**

A state level workshop on “DESIGN OF EXPERIMENTS” was held at Sandip Institute of Technology and Research Centre on 21st and 22nd March 2017. In a highly competitive world of testing and evaluation, an efficient method for testing many factors is needed. Design of Experiments is a series of tests in which purposeful changes are made to the input variables of a system or process and the effects on response variables are measured. A scientific approach to plan the experiments is a necessity for efficient conduction of experiments. By the statistical design of experiments, the process of planning the experiment is carried out, so that appropriate data will be collected and analysed by statistical methods resulting in valid and objective conclusions. To understand exact phenomenon of analysis, ANOVA test has been performed on various case studies. In this workshop total 87 faculty members from various Engineering Institutes all over Maharashtra state has been participated. DOE methods like Full Factorial, Mixed Factorial, Response Surface Methodology and Taguchi Design has been explained briefly. Design of Experiments plays a very important and vital role for research experimentation and validation of conducted experiments. Thereby to cater the need of researchers this event was organized. Lastly after the feedback from the participants it can be conclude that this two days workshop was an fruitful experience for them.



## **Industrial Visit to Kadava Cooperative Sugar Factory**

Final year students of Mechanical Engineering are studying a course on Power Plant Engineering. The course is framed to enable graduating students to take up the challenges in power engineering such as design equipment, processes and whole system. In this endeavour, a visit to study thermal power plant with co generation unit was planned as per curriculum. Kadva sugar mill plant visited has been installed by Walchand Industries, Sangli and periodically upgraded with technological advancements. It was shut down for maintenance work after closure of their crushing season of this year. This also helped to show the interior parts of some leading equipment such as furnaces, boiler tubes, co generation system etc. It comprises two water tube boiler units operating at 21 bar with yield of 20 ton of steam generation per hour. Each boiler is supported by two furnaces which consume bagasse which is a refused material after crushing sugarcane. Furnaces are provided with hot air passing over preheaters creating forced draft. The steam generated being wet is superheated while passing through superheaters tubes. Then superheated steam expands across single turbine unit to 6 bar. The exhausted steam is supplied for sugarcane juice concentration as a part of process heating. Also, it is used in

crystallizers. Also, as a measure of efficiency improvement, economisers are installed in the flow path of flue gases leaving the furnaces.

All the students were given illustrations regarding testing and operating protocols. Students observed and recorded technical details shown by operators of respective sections.

