

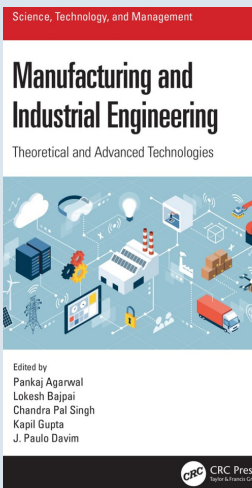


AT A GLIMPSE

- From HOD's desk: Additive Manufacturing
- Some Of the Identified problems of the Society
- Achievements of students and faculty members
- Futuristic Trends in Mechanical Engineering
- Departmental research
- Departmental activities
- Research publications
- Placements of Batch 2022
- Sarcasm

ACHIEVEMENTS

Book Publication: *Manufacturing and Industrial Engineering*, Edited by **Dr. Pankaj Agarwal**, (Professor and Head - MED) and **Dr. C.P. Singh** (Asst. Prof. -MED) & et.al was published by **CRC Press (Taylor & Francis) International publications.**



Mr. Hariom Kushwaha (student B.Tech 3rd year - Mechanical) secured 2nd rank in the National Marathon, State Athletics

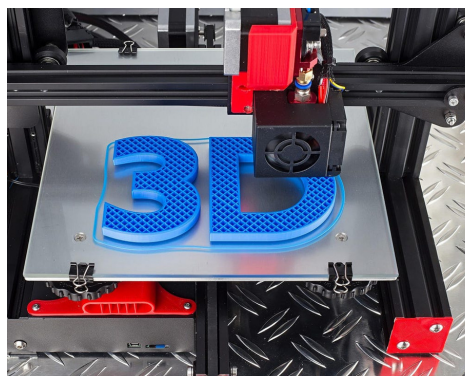


A UV-sanitizing Robot is developed by Nirbhay Borikar B.Tech 3rd year Mechanical student which is fabricated to disinfect and sanitize places such as meeting rooms, classrooms, etc using UV light of effective intensity to kill microorganisms and viruses and works automatically. It can be operated by a mobile app from outside the room protecting the operator from UV exposure. UV-disinfection robots offer a non-touch technology, delivering disinfection by irradiation UV light of effective intensity. This Project is funded by our institute.

Ph.D. Awarded: Dr. Prem Narayan Ahirwar has been Awarded the Degree of Ph.D. (Doctor of Philosophy) in Mechanical Engineering from the Barkatullah University, Bhopal (M.P.). He completed his Doctorate Under the Guidance of **Dr. Pankaj Agarwal** (Professor & Head, Mechanical deptt, S.A.T.I), The research topic is "Design and Development of Multi-objective Dynamic Facility Layouts and its applications".

FROM HOD'S DESK

Dr. Pankaj Agarwal, Professor & Head, Department of Mechanical Engineering



Additive Manufacturing is a popular topic now a day in almost every curriculum of B.Tech Mechanical Engineering. It is popularly known as **3-D printing**, which produces a physical realization model from a CAD model. It is also an important component of industry 4.0 which is representing the 4th industrial revolution and includes almost all the present technological advancements such as **Artificial Intelligence, Cloud Computing, IoT, Augmented reality, Cyber-Physical systems, and so on.**

The significant characteristics of additive Manufacturing include manipulation of material density while fabricating any product, which helps in making low-weight products with the same strength and lifecycle. Additive Manufacturing also makes it possible to manufacture any part in a space station under controlled conditions. The significant role of additive manufacturing is seen in medical applications. The customized implants and repairing of fractured body parts are become possible due to this technique and the development of Bio-Materials. We have recently developed an additive manufacturing laboratory in our department under the TEQIP-III grant. This lab comprises One FDM m/c of size (500*500*500mm), One FDM m/c of size (250*250*250mm), One 3-D Scanner to replicate the existing product or profile, and supporting software and systems. Recently two M.Tech (APS) Student has completed Their dissertation work in this lab and many more UG & PG students are doing their Projects & dissertation work.

SOME OF THE IDENTIFIED PROBLEMS OF THE SOCIETY

- Design of knee support for the elderly for transferring body weight to the shoe.
- Cost-effective mechanism to treat wastewater in small Villages.
- Design of Drones & Robots that can solve some pressing challenges, such as handling medical emergencies, search and rescue operations.
- AI-based interactive robot for elderly care.
- Solar-powered smart irrigation system.
- Device to check the harmful chemicals in Vegetables & fruits.
- To design the helmet to reduce the chances of an accident, and control the proper scattering of light during night riding. By: Prof. Yashwant Ahirwar
- Design of a mechanism for an extra wheel attachment in two-wheelers for the motion in case of a flat tire. By: Prof. Nikhil Mohan Vyas

DEPARTMENTAL RESEARCH

- **Indian Patent Published:** Title - "System of Computerized articles sorting based on color, shop, odor, and weight." by **Dr. Pankaj Agarwal & et.al** Application No-201941027667
- **Australian Patent Granted:** Title: "System for secure authentication and intercommunication among networked IoT Devices". by **Dr. Pankaj Agarwal & et.al** Australian Patent Number: 2021102117 .

UPCOMING WEBINARS/ WORKSHOPS

1. **Two days workshop on "CFD simulation using ANSYS".**
Date: 19th & 20th Feb. 22
Coordinators: **Dr. Mangal Singh Lodhi and Prof. Balendra Dhakar**
2. **One-day workshop on, "CAD/CAM"**
Date: 26th Feb. 22
Coordinator: **Prof. Balendra Dhakar**

FUTURISTIC TECHNOLOGIES IN ENGINEERING

- **Artificial intelligence and machine learning:** AI is the technology where a machine tries to simulate human behavior. It is definitely the future of every industry as AI is being used in most up-and-coming technological fields like robotics, VR, IoT, etc. ML also helps applications make better prediction outcomes.
- **Industry 4.0:** It encapsulates future industry development trends to achieve more intelligent manufacturing processes, including reliance on cyber-physical systems, IoT, cloud computing, which leads to the implementation and operation of smart factories. The concept of industry 4.0 promises many positive changes to today's manufacturing, including mass customization, flexible production, increased production speed, high product quality, etc.
- **4D Printing Technology:** 4D printing is also known as 4D bioprinting, active origami, or shape-morphing system uses the same technique of 3D printing through computer programmed deposition of material in successive layers to create a three-dimensional object. This 4D technology is still in the early phase of research and development. This technology has been used in a few labs or prototyping facilities.
- **Green Manufacturing:** The "greening" of manufacturing in the sense of reducing waste and pollution by minimizing natural resource use, reusing and recycling waste, and reducing emissions. It is implemented in the Production System, International Organisation of Standardization, and many more.

SARCASM**What is the definition of an engineer?**

Someone who solves a problem you didn't know you had in a way you don't understand

New engineer: "How do you estimate how long a project will take?"

Seasoned engineer: "I add up the time required for each task, then multiply the sum by pi."

New engineer: "Why pi?"

Seasoned engineer: "It ensures that all my budgets are irrational."

Our Team**Advisor:**

Dr. Pankaj Agarwal
Professor & Head, MED.

Faculty coordinator

Prof. Nikhil Mohan Vyas,
Asst. Prof. (Contract), MED.

Editors:

Aishvary Turkar (3rd Year)

Abhishek Rai (3rd Year)

Shalu Dwivedi (3rd Year)

Aditya Suryawanshi(2nd Year)

DEPARTMENTAL ACTIVITIES**Mentor-Mentee Program**

Students of 2nd year, Mechanical Engineering have been linked to the alumni of SATI, to promote a culture of students' mentoring by experts, so as to motivate and support students in achieving their academic and career goals. The names of these alumni, who are mentors to the students are :

Vijay Kumar Shukla, Rohan Singh, Awesh Jain, Mukesh Jain, Balram Singh Yadav, Shraddha Gawade, Vipin Kumar Singh, Sachin Kumar Garg, Manish Kumar, Bhagyashri Sathe, Puneet K Tayal, S.P. Pandey, Manish Roy, Lalit Premchandani, Deepanshu Dwivedi, Kaushal Shrivastava, Gurmeet Singh Oberoi, Shruti Soni, P. K. Mishra, Keerti Bundela, Alok Ranjan Bhardwaj, Sandeep Malviya, Hirendra Dandekar.

RESEARCH PUBLICATIONS

- Dr. Pankaj Agarwal, Dr. Ashish Manoria & et. al, "**Analysis and prioritization of Lean manufacturing framework with multi-criteria decision-making approach.**" Journal of Huazhong University of Science and Technology, Vol. 50, Issue 7
- Dr. Pradeep Singh, & et.al, "**Synergistic effect of heat treatment and reinforcement content on the microstructure and corrosion behavior of Al-7075 alloy based nanocomposites**" Journal of Alloys and Compounds, 857, 157590.
- Dr. Ashish Manoria, Dr. Pankaj Agarwal, & et. al. "**An experimental analysis of design, fabrication, and quality improvement procedure in 3D printed products**", Journal of Design Engineering (Toronto), 2021, Issue 7, 14647 - 14659.
- Dr. Pradeep Singh, & et.al "**Novel synthesis approach of making efficient nanocomposite via powder metallurgy route: Study of microstructure and mechanical properties**" Manufacturing Letters, ISSN: 2213-8463.
- Pankaj Sonkusare, "**A review paper - Study of various renewable resources polymer and different types of nano-composite materials**", Conference on "Technology and Innovation in Mechanical Engineering" (TIME-2021)
- Dr. Pradeep Singh, Dr. Pankaj Agarwal, JP Shakya, DP Mondal, "**Effect of Ball Powder Ratio on microstructure and compressive behavior of porous Ti-4wt %Al alloy**", IOP: Materials Science & Engineering,1136.
- Dr. Arvind Kumar Patel, "**An unconventional approach for performance improvement of vapor compression refrigeration system using nanoparticles.**" & "**Heat transfer Enhancement in Mini-channel Heat Sink using Water, EG, and EG20 Based Nanofluids- CFD Analysis**" International Conference on Mechanical Engineering and Managerial Applications for Productivity Enhancement and Marketability, Organized by Maulana Azad National Institute of Technology, Bhopal on September 15-16 2021.

Book Chapter published/Accepted:

- Dr. Pradeep Singh, Dr. Pankaj Agarwal, IB Singh, DP Mondal "**An Overview of Human Bone, Biomaterials and Implant Manufacturing**" Manufacturing and Industrial Engineering: Theoretical and Advanced Technologies, CRC Press, 135-169.
- Dr. Pradeep Singh, Shashank K Shrivastava, Gaurav K Gupta, Tilak C Joshi, Ashutosh Pandey, Dilip Muchhala, Vikas Shrivastava, D.P. Mondal "**Existence of Advanced Ceramic materials in Human Life**, Elsevier, Advanced Ceramic for versatile interdisciplinary application. B-978-0-323-89952-9-.0013-0.

Award:

- Dr. Pradeep Singh, **Best Paper/presentation award for the paper** "Effect of Ball Powder Ratio on microstructure and compressive behavior of porous Ti-4wt %Al alloy" International conference: Materials, Mechanics, Mechatronics and Manufacturing.

RECENT PLACEMENTS**TCS**

Mr. Shubham Chaudhary, Mr. Rakesh Mishra, Mr. Neeraj Jaiswal, Mr. Kunal Pawar, Mr. Harshit Rai,

Mr. Sanjay Suryawanshi, Mr. Ayush Gupte

Intellipat

Mr. Yash Naiwar and Mr. Shivam Patel

Infosys

Ms. Alka Asati

Evosys

Mr. Shubham Kumar

The students who wish to share any *article, research, achievement, certification, etc.* for publishing in the next edition of the "**Mechanical Newsletter**", can submit their work at

newsletter.me@satiengg.in

For any suggestions, updates, and queries, you can contact us at the above-mentioned email.