

DESIGN AND MANUFACTURING

Research Center

Steadily moving towards more automated and process-driven manufacturing, which is projected to improve efficiency and enhance productivity.

Version 1/2023





Prof. Mir Sadat Ali

CEO

With immense pleasure, enthusiasm and satisfaction, I present the Design and Manufacturing Research Center profile. It is to demonstrate /showcase the integration of practice-project-production-based learning. In other words, it's hands-on experimental learning. Each experimental learning laboratory is the marvel of learning and the epitome of integrating skills in education. The research outcome of the learning center indicates the wide area of application.

Here we are trying to demeanor our activity in a nutshell. This research center practices a pedagogy that fulfils the requirements of the industry and makes the trainees industry ready, employable and well-versed with industry-set work parameters.

Hopefully, this center will achieve greater heights by adding new industry practices, job roles and state-of-the-art experiential laboratories in future. I congratulate the entire faculty and support staff team for putting in their best efforts to bring laurels to the research center. I look forward to receiving the best efforts from each team member to develop the research center to skill integrated experiential learning center.

Mir Sadat Ali

HIGHLIGHTS

About Us

Focus Areas

**Student
Involvement**

Publications

Achievements

Future Plans

Materials
Sustainable materials

Renewable
Recycled or composted

Design
Designed for the long-term

Restored
Repaired and mended

Manufacture
Ethically & sustainably produced

Long-lasting
Reused and upcycled

Retail
Sold or lent to customers

OUR VISION

The center seeks to strengthen science and engineering research, product development and innovation; advance education and workforce training in new technologies.

OUR MISSION

Strengthening innovative industry-academia-partnerships through Design & Manufacturing.

OUR VALUES

Excellence and performance; Collaboration and sharing of knowledge; Respect and social commitment.

Quality Policy

Providing the best quality research, products & services. Attempting opportunities continuously for up-gradation and development of products and manufacturing methods for self and community empowerment.

Team



Prof. Mir Sadat Ali

CEO

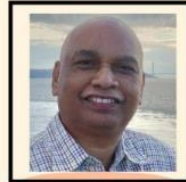
AREA OF EXPERTISE Manufacturing Technology



Prof. Dillip Mohanta

COORDINATOR

AREA OF EXPERTISE Manufacturing Technology



Prof. Murali Veeravalli

MEMBER

AREAS OF EXPERTISE CAD, CAE, FEA



Dr. Mukundjee Pandey

MEMBER

AREAS OF EXPERTISE CFD & FEA



Dr. Dojalisa Sahu

MEMBER

AREA OF EXPERTISE Materials Chemistry



Dr. Sujit Mishra

MEMBER

AREAS OF EXPERTISE CAD, CAM & CFD



Dr. Biranchi Prasad Mishra

MEMBER

AREA OF EXPERTISE Unconventional Machining



Dr. Koyilada Benarji

MEMBER

AREA OF EXPERTISE Additive Manufacturing



Prof. Gedala Sridevi

MEMBER

AREA OF EXPERTISE Additive Manufacturing



Prof. Swakantik Mishra

MEMBER

AREA OF EXPERTISE Energy Management



Prof. Chittaranjan Routray

MEMBER

AREA OF EXPERTISE Polymer Science



Prof. V. Khageswar

MEMBER

AREA OF EXPERTISE Welding Technology

FOCUS

A R E A S



CNC Machining

Improving skills and developing high-precision products with the most popular manufacturing techniques that use automated tools.

1



3DEXPERIENCE

Connecting people, ideas, data and solutions in a single collaborative environment to empower product development and businesses in entirely new ways.

2



Additive Manufacturing

Focusing on all aspects of additive and 3D printing technology providing the new product technologies, process solutions to make end-use parts.

3



Wood Engineering Design and Product Development

Developing modern and innovative wooden products with a broader social and institutional context of sustainability.

4



Apparel Manufacturing

Sensitization and amplification of advanced sewing technology to produce own brand of apparel by the name of "Aussie" exclusively designed and manufactured by differently-abled youth.

5



Heavy Electrical Equipment & Transformer

Revolving around transformer design, manufacturing, QC, and Maintenance. Creating technically trained manpower readily available for power/energy sectors.

6



Composites & New Materials

Developing new materials and optimizing properties for a required application through new age techniques and software tools.

7



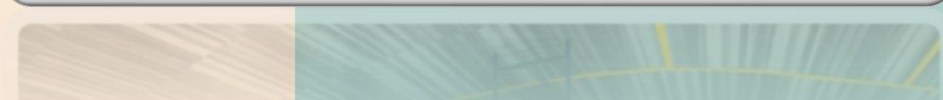
Electric Vehicle

Facilitating the transition to sustainable energy by designing, developing, manufacturing and selling electric vehicles. Offering skills in the installation and maintenance of end-to-end clean energy products.

8



PRECISION MACHINING
LEARNING LAB.



SUSTAINABLE
RESEARCH
INFRASTRUCTURES

ELECTRIC VEHICLE LAB.



ADVANCED WOOD
ENGINEERING LEARNING LAB.



SUSTAINABLE
RESEARCH
INFRASTRUCTURES

HEAVY ELECTRICAL
EQUIPMENT LAB.



FUTURE NEXUS LAB.



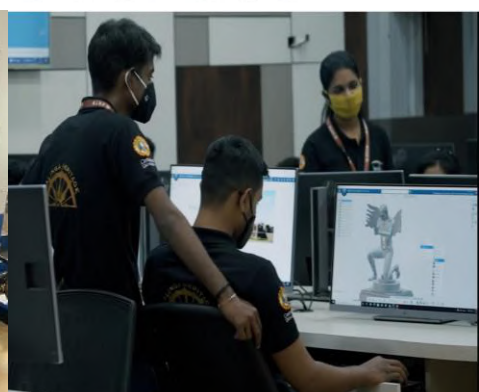
SUSTAINABLE
RESEARCH
INFRASTRUCTURES

3D PRINTING LAB.



STUDENT INVOLVEMENT

Academic Domains Summer Internships Short-term Courses



2023

METAL MACHINING

Mohanta, D.K., Sahoo, B.D., & Mohanty, A. M. 2023. Optimization of Process Parameter in Al7075 Turning Using Grey Relational Desirability Function And Metaheuristics, Materials and Manufacturing Processes.1042-6914. DOI: 10.1080/10426914.2023.2165671.

THERMAL ENERGY

Pandey, M., Padhi, B.N., & Mishra, I. 2023. Thermoeconomic analysis of a solar combined cycle with Brayton, Kalina, and Organic Rankine Cycle. International Journal of Exergy. 40(4): 392-413. <https://doi.org/10.1504/IJEX.2023.130364>.

RENEWABLE ENERGY

Mishra, I., Senapati, P., & Pandey, M. 2023. Numerical simulation of solar parabolic trough collector with helical grooves using Cu nanoparticles. Material Proceedings. 74(4):867-873. DOI: 10.1016/j.matpr.2022.11.272

2022

BIOFUEL

Rath, M.K. & Mohanta, D.K. 2023. Exergy and energy analysis of compression ignition engine using diesel and karanja oil blends under varying compression ratio and engine load, Biofuels. 14:2, 173-182. DOI: 10.1080/17597269.2022.2124687.

BIOMECHANICS

Mohanty, R.K., Mohanty, R.C., Sabut, S., Pandey M. 2022. Conformity assessment with structural strength requirements of mechanical polycentric prosthetic knee used for amputee rehabilitation. Computer Methods in Biomechanics and Biomedical Engineering. Computer Methods in Biomechanics and Biomedical Engineering. 26: 764-776. <https://doi.org/10.1080/10255842.2022.2088233>.

MOLECULAR SCIENCE

Palai, A., Panda, N.R., Sahu, D. 2022. Novel ZnO blended SnO₂ nanocatalysts exhibiting superior degradation of hazardous pollutants and enhanced visible photoemission properties, Journal of Molecular Structure. 0022-2860. DOI: 10.1016/j.molstruc.2021.131245.

MATERIAL SCIENCE

Sahu, D., Palai, A., Sahoo, M.R., Panda, N.R. 2022. Study on the electronic band structure of ZnO-SnO₂ heterostructured nanocomposites with mechanistic investigation on the enhanced photoluminescence and photocatalytic properties, Journal of Material Science and Materials in Electronics. 0957-4522. DOI: 10.1007/s10854-021-07583-x.

MATERIAL SCIENCE

Dash, D., Palai, A., Sahu, D. 2022. Nanocrystalline gadolinium doped ZnO: An excellent photoluminescent material and efficient photocatalyst towards optoelectronic and environment remedial applications, Ceramics International, Volume 48, Issue 19, Part B, 2022,Pages 28835-28842, ISSN 0272-8842, <https://doi.org/10.1016/j.ceramint.2022.03.139>.

2021

METAL MACHINING

Mohanta, D.K., Pani, B., Sahoo, B.D., & Mohanty, A. M. 2021. A Critical Study on Computation of Cutting Forces in Metal Cutting, Journal of Physics: Conference Series, 1742-6588, Vol. 2070, 2021, DOI: 10.1088/1742-6596/2070/1/012166.

MATERIAL SCIENCE

Sahu, D., Pati, S., Panda, N.R., Das, D. 2021. Effect of incorporation of magnetization in antiferromagnetic Cr₂O₃ by mechanically alloying with α -Fe nanoparticles, Materials Letter. 0167-577X. DOI: 10.1016/j.matlet.2021.130170.

THERMAL ENERGY

Pandey, M., Padhi, B.N., & Mishra, I. 2021. Selection of low-temperature power cycles. Thermal Sciences. 25(2): 1587-1598. <https://doi.org/10.2298/TSCI191116165P>.

RENEWABLE ENERGY

Pandey, M., Padhi, B.N., & Mishra, I. 2021. Numerical simulation of solar parabolic trough collector with arc-plug insertion in Energy Sources-Part-A, Recovery and Utilization; Taylor & Francis, <https://doi.org/10.1080/15567036.2020.1822467>.

Padhi, B.N., Pandey, M. & Mishra, I. 2021. Relation of change in geometrical parameters in the thermal performance of solar chimney. Journal of Mechanical Science and Technology. <https://doi.org/10.1007/s12206-021-0939-8>.

2020

MATERIAL SCIENCE

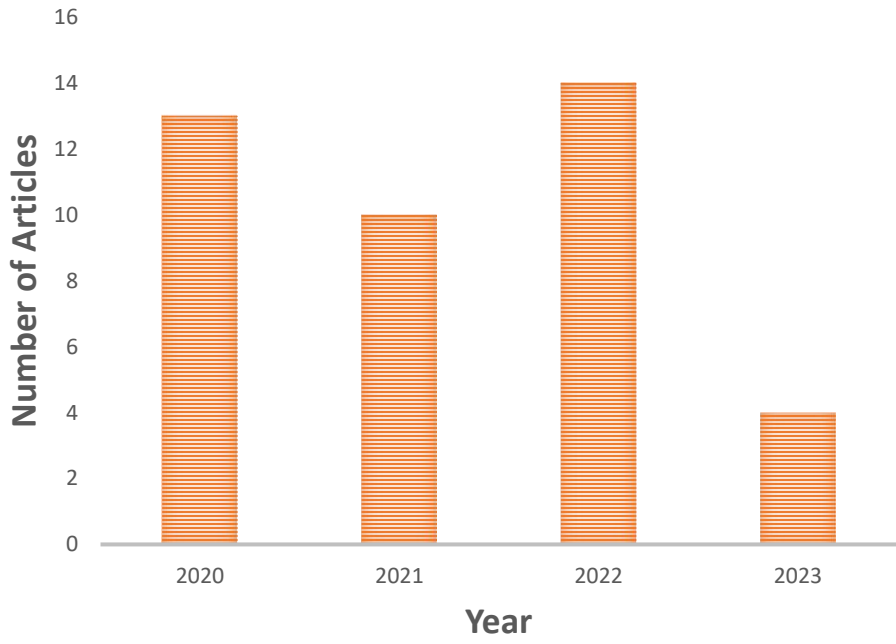
Jena, A., Behera, M., Routray, C., & Biswal, S.K. 2020. Fabrication, Characterization and Antibacterial Study of Polyvinyl alcohol/Cuprous Oxide Nanofluids and Polymer Nanocomposite Films. Oriental Journal of Chemistry, 36,(4). 713-719. DOI: 10.13005/ojc/360416.

RENEWABLE ENERGY

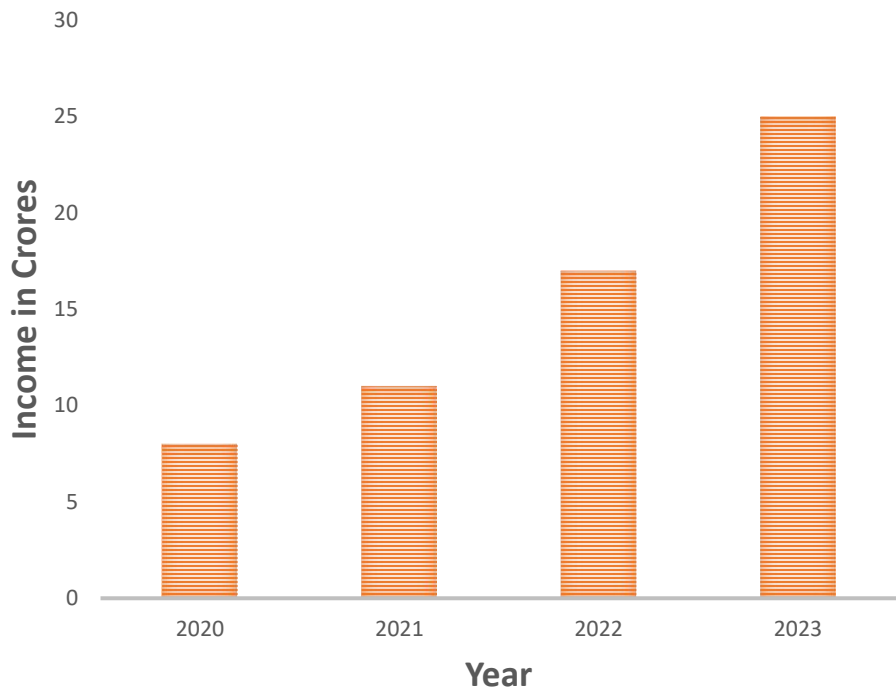
Pandey, M., Padhi, B.N., Mishra, I. 2020, Simulation and Modeling of Solar Trough Collector, Advances in Interdisciplinary Engineering, Springer Singapore. 917 [885]. DOI:10.1007/978-981-13-6577-5_29.

ACHIEVEMENTS

PUBLICATIONS



PRODUCTS & PROJECTS





Industry Partners

Training, Design, Project, Product

Outcome and Impact-oriented Education, Productive Nation



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