Department of Mechanical Engineering

AJAY BINAY INSTITUTE OF TECHNOLOGY

Achievements

- Placement Drive Programme
- National Girls Child Day Celebration

MECH-a-BIT

~Newsletter of Mechanical Engineering Department~

Volume-4,Issue-4 April-2024

PLACEMENT DRIVE IN MECHANICAL DEPARTMENT

Our students of B. Tech (2020-24) Batch for getting through Various Companies Such **Zenus Group**(Ananta k. Paul)

CelebratingNational Girl child Day at Our Department was a joyous occasion.

All Students, Faculty, and staff came together to honour and appreciate the incredible contributions of gorls. The vibrant event showcased unity and empowerment. Lets continue supporting and uplifting our girls, ensuring they thrive in every aspect of life

Steampunk Repin Vertical steam engine

Faculty Achievements

- Satya Ranjan patnaik, Associate Professor, has Published a paper title "Mechanical act of usual fiber reinforced composites considering fly-ash customized moulds" in Futuristics Trends in Mechanical Engineering (UGC CARE), 2024
- Narasingh Deep, Associate Professor, has Review a paper title "A Comprehensive review on innovative building materials" in Shaping Identity:Unveilling the powerof design identity (UGC CARE), 2024
- Pabak Mohapatra, Assistant Professor, has published a paper titled "*Experimental studies on corrosion performance of Reheated AZ31 Magnesium Alloy*" in Journal of Lecture notes in mechanical engineering in SCOPUS 2023.
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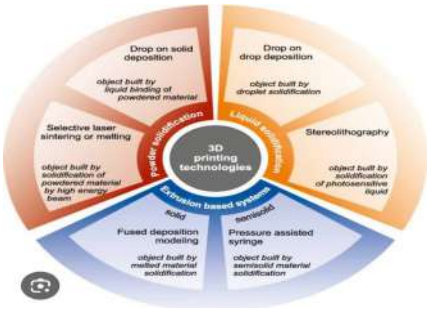
AJAY BINAY INSTITUTE OF TECHNOLOGY

Recent Advances in Mechanical Engineering

Additive Manufacturing(3D Printing)



Large-Scale Applications*: Companies like Relativity Space are 3D-printing entire rockets (e.g., Terran R), reducing weight and production costs .

Medical Implants*: Customized prosthetics and biocompatible implants are being produced with precision using metal and polymer 3D printing .

Additive manufacturing, commonly known as 3D printing, is a process that builds three-dimensional objects layer by layer from a digital model, using techniques like material extrusion, powder bed fusion, or vat photo polymerization.

Key Techniques:

Material; Extrusion:

Uses a heated nozzle to extrude a filament of material (like plastic) layer by layer.

Powder Bed Fusion:

Uses a laser or electron beam to selectively fuse powdered material, layer by layer, to create a solid object.

Vat Photopolymerization:

Uses a vat of liquid photopolymer resin, which is solidified by a light source layer by layer.

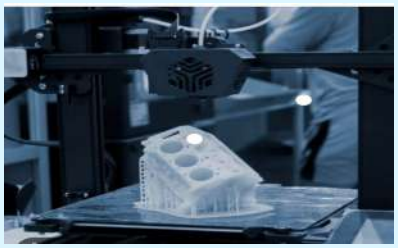
Benefits of Additive Manufacturing:

Complex geometries: AM allows for the creation of intricate and complex shapes that are difficult or impossible to produce using traditional methods.

Customization: AM enables rapid prototyping and the creation of unique, customized parts.

Reduced waste: AM can minimize material waste compared to subtractive manufacturing.

On-demand manufacturing: AM allows for the production of parts only when needed, reducing inventory costs.



Department of
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AJAY BINAY INSTITUTE OF TECHNOLOGY

MECH-a-BIT

~Newsletter of Mechanical Engineering Department~

Volume-4,Issue-3 January-2024

Achievements

Poster Presentation Competition

We are thrilled to share the success of our recent poster presentation competition on 7R-New choice for Green life organized by the Deptr. Of Mechanical Engineering on Decembere 15,2023. 2 nd position of our students Swarup sekhar Mohanty, Biswa Bhusan Palai, Sohail Khan in 3rd semester student

NATIONAL CONFERENCE ON LATEST TRENDS IN MECHANICAL ENGINEERING(01.12.23 &02.12.23)

Our Dept. Organized an enriching Industrial visit to Trupti Automotives (TATA Motors) in Manguli, Cuttack, on November 8, 2023

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AJAY BINAY INSTITUTE OF TECHNOLOGY

Recent Advances in Mechanical Engineering

Robotics and Automation

Robotics and automation are intertwined fields, with automation being the broader concept of using technology to perform tasks automatically, while robotics focuses on the specific design, development, and use of robots for those tasks.

Automation Definition:

Automation is the process of using technology, including software, machines, or other systems, to carry out tasks that would otherwise be performed by humans.

Automation Scope: Automation can be applied to both physical and virtual tasks, ranging from simple processes like a programmable thermostat to complex manufacturing processes.

Robotics Definition:

Robotics is a field that combines engineering, computer science, and other disciplines to design, build, and operate robots.

Robotics Focus: Robotics focuses on the development of robots and their capabilities, including their ability to perform tasks autonomously or semi-autonomously.

Relationship:

Robotics is often a key component of automation, as robots are used to perform many automated tasks.

- The development of robotics and automation technologies often go hand-in-hand, with advancements in one field leading to advancements in the other.

The increasing integration of artificial intelligence (AI) and machine learning (ML) is further blurring the lines between robotics and automation, leading to more intelligent and capable robotic systems.

Department of
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AJAY BINAY INSTITUTE OF TECHNOLOGY

MECH-a-BIT

~Newsletter of Mechanical Engineering Department~

Volume-4,Issue-2 October-2023

Achievements

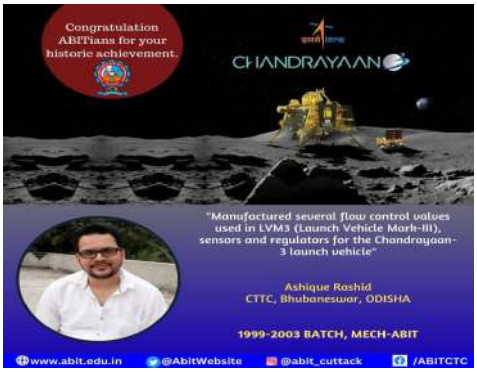
Odisha Startup Yatra

The Odisha Startup Yatra made a stop at our campus on 16th September 2023. Many Students of Mechanical enthusiastically participated and shared their innovative start up ideas, making it an engaging and interactive session for our student community.

National Welding Meet-2023

Our Students and Faculties showcased their passion and commitment to welding excellence, gaining valuable insights and skills.

We express our heartfelt congratulations to the incredible ISRO team member ASHIQUE RASHID for their extraordinary achievement for Chandrayaan-3



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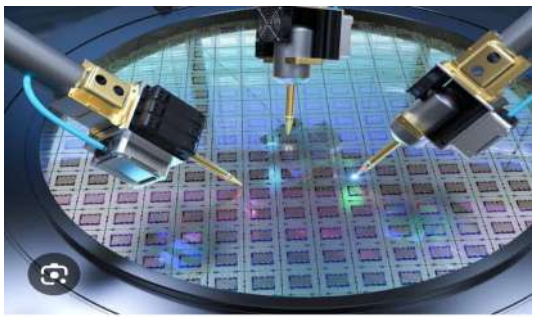
Recent Advances in Mechanical Engineering

Advanced Materials and Nanotechnology



Advanced Materials and Nanotechnology is a field focused on designing, synthesizing, and processing materials at the nanoscale to achieve unique properties and applications across various sectors like energy, electronics, and biomedicine.

What are Advanced Materials?

Advanced materials refer to materials with enhanced or novel properties compared to their conventional counterparts.

What is Nanotechnology?

Nanotechnology involves manipulating matter at the atomic and molecular scale, typically below 100 nanometers.

Key Areas of Research and Development

Energy:Development of advanced materials for energy storage (batteries, capacitors) and energy conversion (solar cells, thermoelectric devices).

Electronics: Creation of smaller, faster, and more efficient electronic devices, including transistors, sensors, and displays.

Materials science: Synthesis and characterization of novel nanomaterials with improved properties and applications.

Interdisciplinary Nature: Advanced Materials and Nanotechnology are interdisciplinary fields, requiring collaboration between researchers in different areas.

Advantages of Nonotechnology

Advanced materials and nanotechnology offer numerous advantages, including creating stronger, lighter, and more durable materials, enhancing energy efficiency, enabling miniaturization in electronics and computing, and facilitating advancements in healthcare and environmental remediation

Department of Mechanical Engineering

AJAY BINAY INSTITUTE OF TECHNOLOGY

Achievement

- Placement Hiring
- Virtual Technical Talk
- Cources for Placement

MECH-a-BIT

~Newsletter of Mechanical Engineering Department~

Volume-4,Issue-1 July-2023

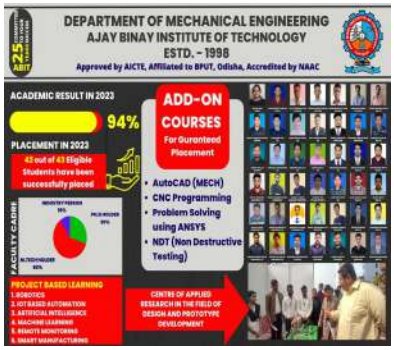
Placement Hiring

Heartly congratulation the following syudent for getting through various companies.students name Subrat mallick, Deepak Bhoi, Asutosh Sahoo, Bishal Mllick, Chinmaya Swain

Virtual Technical talk on Human Machine Interface(HMI)

The event witnessed the active participation of enthusiastic student and faculty member from the department of mechanical engineering. The session featured a captivating talk by Mr. Manoj Pandey, CEO of kemsys Tecnology

Department of Mechanical Engineering ADD-ON-COURCES For Guranteed Placemrnt



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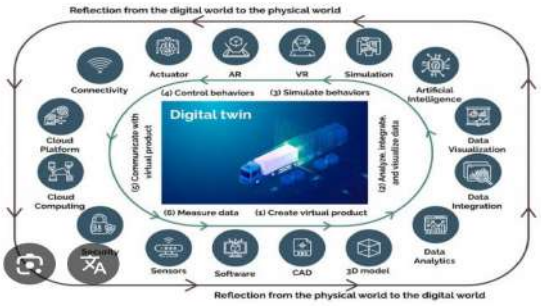
Digital Twins and Simulation



Digital twins are virtual representations of physical assets, systems, or processes, while simulations are virtual models used for testing scenarios and analyzing performance; digital twins leverage real-time data and simulation to mirror the behavior of their physical coun-

Digital Twins:

Definitions:A digital twin is a dynamic, virtual copy of a physical asset, process, system, or environment that looks and behaves identically to its real-world counterpart.

Purpose: Digital twins are used to optimize performance, monitor operations, and facilitate decision-making across various industries.

Key Features:

Real-time data: Digital twins use real-time data from sensors and other sources to update their virtual representation.

Simulation: They use simulation and modeling techniques to mirror the behavior, characteristics, and performance of their physical counterparts.

Simulations:

Definition: Simulations are virtual models of processes, systems, or environments that allow you to test various scenarios without the risks and costs of using actual

Relationship:

Simulations can be used to create and update digital twin s.

Digital twins can leverage simulations to test different scenarios and optimize performance

Digital twins can be seen as a more advanced form of simulation, as they are connected to real-world assets and use real-time data.