PRAGATI ENGINEERING COLLEGE

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#1-378, ADB Road, Surampalem – 533 437, Near Peddapuram, A.P.
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DEPARTMENT OF MECHANICAL ENGINEERING

Academic year: 2024-25 Date: 17-03-2025

CIRCULAR

Additive Manufacturing Club of Mechanical Engineering Department in association with Career Guidance Cell is organizing a Seminar to the Mechanical Engineering students on 19th March 2025. The Theme of the Seminar is *"Classification of Additive Manufacturing Processes"*.

Event	:	Seminar.
Date of the Event	:	19th March 2025.
Venue	:	MF-12.

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PRAGATI ENGINEERING COLLEGE (A) MECH-HOD SURAMPALEM

Copy to:

1. **HOD-ME.**
2. **Departmental file.**
3. **AM Club In-charge – ME.**
4. **Career Guidance Cell In-charge – ME.**

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INDUSTRY 4.0 CLUBS

ADDITIVE MANUFACTURING CLUB

ORGANISED BY DEPARTMENT OF MECHANICAL ENGINEERING IN ASSOCIATION WITH CAREER GUIDANCE CELL

CLASSIFICATION OF ADDITIVE MANUFACTURING PROCESSES

SPEAKER :

Ms.P.Gayatri
Assistant Professor

FACULTY COORDINATOR

Mr. P. Ram Prasad
Assistant Professor
Mechanical Engineering Department

VENUE: MF-12
DATE: 19th March 2025
TIME: 10:00 AM Onwards

STUDENT COORDINATOR

Mr. M.Yadidya
III Year Mechanical Engineering Department

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DEPARTMENT OF MECHANICAL ENGINEERING

A SEMINAR

ON

"CLASSIFICATION OF ADDITIVE MANUFACTURING PROCESSES"

A.Y 2024-25 Dt. 19.03.2025

A seminar on **"Classification of Additive Manufacturing Processes"** was successfully organized by the Additive Manufacturing Club of the Mechanical Engineering Department, in association with the Career Guidance Cell.

The event was held in Room MF-12 and saw active participation from 38 students of II Year Mechanical Engineering. All students who expressed interest were welcomed to attend the seminar, making it an inclusive and enthusiastic gathering of learners eager to explore advancements in manufacturing technology.

The seminar was delivered by **Mrs. P. Gayathri**, who effectively engaged the students throughout the session. Her interaction was insightful, making complex topics related to additive manufacturing processes easy to understand and highly relevant to current industry trends.

The session focused on the classification of various additive manufacturing techniques, their principles, applications, and relevance in modern industrial practices. The students gained valuable knowledge that supports both their academic learning and future career aspirations in the field of advanced manufacturing.

Additive Manufacturing (AM) refers to a set of processes used to create objects by adding material layer by layer, as opposed to traditional subtractive manufacturing techniques, which remove material. AM is widely used in various industries such as aerospace, automotive, healthcare, and consumer goods, offering the ability to create complex geometries and customized designs.

Here's an overview of the key Additive Manufacturing processes:

1. Fused Deposition Modeling (FDM)

- Process: A thermoplastic filament is heated and extruded through a nozzle, which deposits material layer by layer to build up the desired part.
- Materials: Thermoplastics like ABS, PLA, and PETG.

- Applications: Prototyping, functional parts, and low-volume production.

2. Stereolithography (SLA)
   - Process: A laser cures liquid photopolymer resin, solidifying it layer by layer to form the final object.
   - Materials: Photopolymer resins (various types for different properties).
   - Applications: High-detail prototypes, dental, jewelry, and medical models.

3. Selective Laser Sintering (SLS)
   - Process: A high-powered laser sinters (melts) powdered materials (e.g., plastics, metals) together to form solid layers. The powder bed supports the part during printing.
   - Materials: Nylon, polystyrene, metals, ceramics.
   - Applications: Functional prototypes, end-use parts, aerospace, automotive.

4. Selective Laser Melting (SLM)
   - Process: Similar to DMLS, but with a stronger focus on fully melting the metal powder. SLM achieves dense, fully metallic parts.
   - Materials: Stainless steel, titanium alloys, aluminum alloys, cobalt chrome.
   - Applications: Aerospace, medical implants, tooling.

5. Binder Jetting
   - Process: A liquid binder is deposited onto a powder bed, layer by layer, to bond the powder particles together. After printing, the part is often post-processed by curing or sintering.
   - Materials: Sand, metals, ceramics.
   - Applications: Sand casting molds, metal parts, prototyping.

6. Material Jetting
   - Process: Droplets of photopolymer material are jetted and cured using UV light to form solid layers.
   - Materials: Photopolymers.
   - Applications: Prototypes, detailed models, full-color parts.

7. Laminated Object Manufacturing (LOM)
   - Process: Layers of material, such as paper or plastic, are bonded together with adhesive and cut into shape with a laser or blade to form a part.
   - Materials: Paper, plastic, metal foil.
   - Applications: Prototyping, conceptual models, tooling.

8. Vat Polymerization
   - Process: A resin is cured by light (e.g., UV light) layer by layer in a vat to form the final object.
   - Materials: Photopolymer resins.

- Applications: High-detail prototyping, dental applications.

Benefits of Additive Manufacturing:

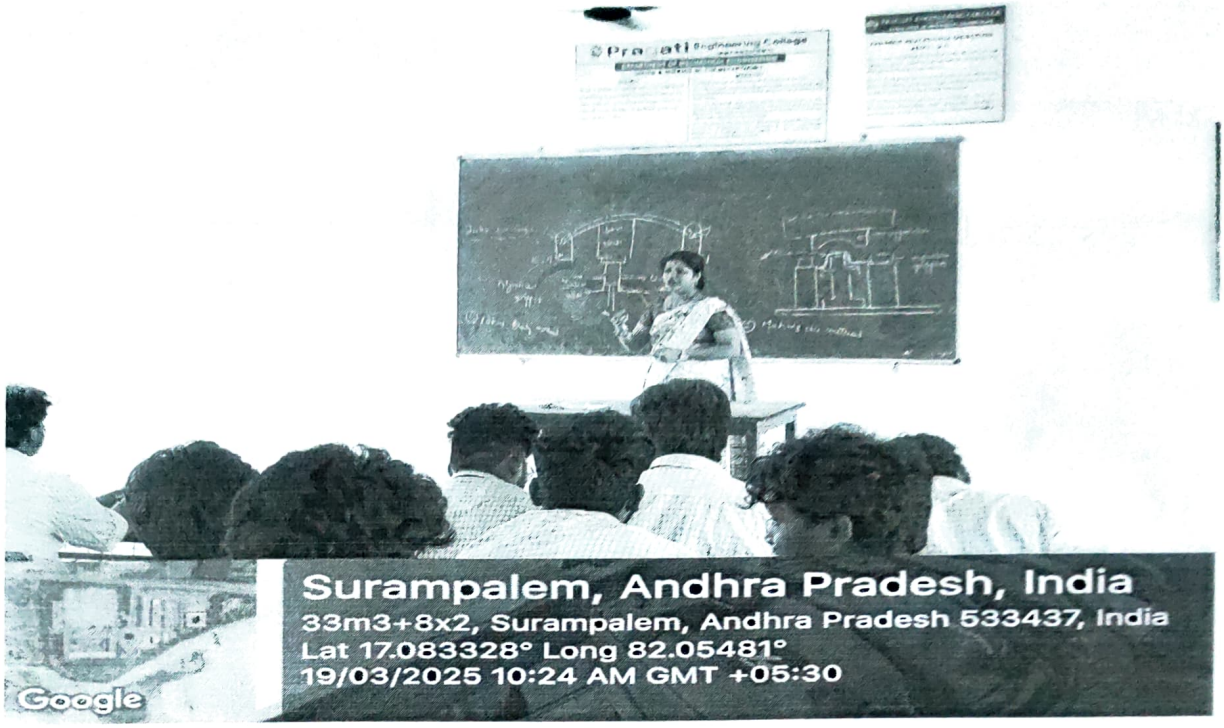
- Complex Geometries: AM allows for the creation of intricate designs that would be difficult or impossible to achieve with traditional manufacturing.
- Customization: Parts can be easily customized or personalized without the need for additional tooling.
- Material Efficiency: AM is more material-efficient because it only uses the material needed for the part.
- Reduction of Lead Time: Rapid prototyping can speed up product development, reducing the time from design to production.
- Low Volume Production: Ideal for low-volume, customized production, as tooling is not required.

Limitations:

- Speed: Some AM processes can be slower compared to traditional methods.
- Surface Finish: Parts often require post-processing to improve surface finish.
- Material Constraints: Limited materials available in some AM processes compared to traditional manufacturing.

Additive manufacturing offers numerous advantages, especially in terms of design flexibility and customization, but it also has limitations in terms of speed and material properties. It is continuously evolving, with new materials and technologies expanding its applications across various industries.

PICTURES OF THE EVENT:



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Participants List

Name of the Event: Classification of Additive Manufacturing Processes

Venue : MF-12

Date : 19/3/25

S.No	Roll No	Name	Signature
1.	23A31A0325	K. Veera Manikanta	K. V. Manikanta
2.	24A35A0311	P. D. Neelesh Kumar	P. D. Neelesh Kumar
3.	23A31A0328	K. satya chakra Dhora	K. satya chakra Dhora
4.	24A35A0317	Y. Siva Shankar	Y. Siva Shankar
5.	23A31A0320	G. V. S. Subrahmanyam	G. V. S. Subrahmanyam
6.	23A31A0343	R. P. Arun Kumar	R. P. Arun Kumar
7.	23A31A0319	ch. Mohan krishna	Ch. Mohan krishna
8.	24A35A0308	M. Durga Suresh	M. Suresh
9.	23A31A0345	S. Siva Sai	S. Siva Sai
10.	23A31A0327	K. Sivaji Ganesh	K. Sivaji Ganesh
11	24A35A0302	D. Lakshmi Narayana	D. Lakshmi Narayana
12	24A35A0303	D. Divakar	D. Divakar
13.	23A31A0341	P. Prasanth	Prasanth
14.	23A31A0338	P. V. N. Venkata Siva	P. V. N. V. Siva
15.	23A31A0312	B. B. S. D. V. Pothuraju	B. Bhagavan

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16	23A31A0350	V.V.V. Satyanarayana	V.V.V. Satya
17	23A31A0340	P. Bhanu	P. Bhanu
18	23A31A0331	M. Kiran Teja	M. Kiran Teja
19.	24A35A0309	P. mahesh	P. mahesh
20.	23A31A0322	G. Karun Kumar	G. Karun
21	23A31A0306	S. yohanna	S. yohanna
22	23A31A0342	R. Manidheep	R. Manidheep
23	23A31A0316	CH. Santhosh Kumar	CH Santhosh Kumar
24	24A35A0316	T. Devachandra Rao	
25	24A35A0306	K. Pavan Kumar	K. Pava
26	24A35A0305	K. Satwik	K. Satwik
27	24A35A0310	P. Rishikesh	P. Rishikesh
28	23A31A0311	B.H.S.O. MRUTYU MJAY.	B.H.S.O. Mrutyunj
29	24A35A0307	Mh. Bala Bhavani Sankar	Mh. B.B. Sankar
30	24A35A0315	D. Chandu	D. Chandu

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31	23A31A0326	K. Kameswara Rao	K. Kameswara Rao
32	24A35A0313	S. Manikanta	S. Manikanta
33	23A31A0309	A. Vasanth Surya	A. Vasanth Surya
34	23A31A0336	P. D. Ashok	P. D. Ashok
35	23A31A0333	V. Bala Vamsi Krishna	V. B. V. Krishna
36	23A31A0301	B. Soni Ramya	B. Ramya
37	23A31A0305	Revathi. M	Revathi.
38	23A31A0302	D. Avanthi	D. Avanthi

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