



# PRAGATI ENGINEERING COLLEGE

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

Academic year: 2023-24

Date: 07-02-2024

## CIRCULAR

Additive Manufacturing Club of Mechanical Engineering Department in association with Career Guidance Cell is organizing a Seminar to the Engineering students on 9<sup>th</sup> February 2024. The Theme of the Seminar is “*Design for Additive Manufacturing: Recent Innovations and Future Directions*”.

**Event** : Seminar  
**Date of the Event** : 9<sup>th</sup> February 2024  
**Venue** : MF-1.

INCHARGE

HOD-ME



Copy to:

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



**PRAGATI ENGINEERING COLLEGE**

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**INDUSTRY 4.0 CLUBS**

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# **ADDITIVE MANUFACTURING CLUB**

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

## **"DESIGN FOR ADDITIVE MANUFACTURING: RECENT INNOVATIONS AND FUTURE DIRECTIONS"**

### **SPEAKER :**

**Mr. P. Ram Prasad**  
Assistant Professor

### **FACULTY COORDINATOR**

**Mr. P. Ram Prasad**  
Assistant Professor  
Mechanical Engineering Department

**VENUE: MF-1**

**DATE: 9th February 2023**

**TIME: 10:00 AM Onwards**

### **STUDENT COORDINATOR**

**Mr. D.Ashish Varma**  
III Year Mechanical Engineering Department  
Contact No. : +91 7095338669





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## DEPARTMENT OF MECHANICAL ENGINEERING

### Participants List

Name of the Event: Design for Additive Manufacturing: Recent Innovations and  
Future Directions.

Venue : MF-1

Date : 09/02/2023

S.No	Roll No	Name	Signature
1	22A31A0369	V. ASHISH VARDHAN	V. Ashish
2	22A31A0352	B. Mani Rama Ganesb	B. Mani
3	22A31A0389	S. V. Kalyan	S. V. Kalyan
4	22A31A0379	P. Guna Sechar	P. Guna
5	22A31A0367	K. Siddhardha	K. Siddhardha
6	22A31A0386	R. Rajkumar	R. Rajkumar
7	22A31A0362	K. Satyanarayanan	K. Satyanarayanan
8	22A31A0891	T. Muga, Durga, Eswar, Suresh	T. Suresh
9	22A31A0374	Md. Ate Ansari	Ate Ansari
10	22A31A0393	T. Bharath Kumar	T. Bharath Kumar
11	23A35A0314	R. Krishna Sri	R. Krishna Sri
12	23A35A0319	D. Dinesh Kumar	D. Dinesh
13	23A35A0320	K. Dwaga Sai Mahesh	K. Mahesh
14	23A35A0321	K. S. S. Rajesh	K. Rajesh
15	23A35A0323	P. S. D. N. Lokaraju	P. Lokaraju

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S.No	Roll No	Name	Signature
1	23A3SA0322	P.Siva Samkavi	
2	23A3SA0315	Abdullah.D	
3	23A35A0317	ch. Sandeep	
4	22A31A0384	R. Vamsi Nivanjan	
5	22A31A0381	S. Raju	
6	22A31A0368	K. Sathibabu	
7	22A31A0383	P. Uma Krishna	
8	22A31A0359	G. Sriram	
9	22A31A0362	P. Charan	
10	22A31A0364	K. Sivakumar	
11	22A31A0380	P. Sri Ram	
12			
13			
14			
15			


TOTAL 26

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Review

# Design for Additive Manufacturing: Recent Innovations and Future Directions

Paul F. Egan 

Department of Mechanical Engineering, Texas Tech University, Lubbock, TX 79409, USA; paul.egan@ttu.edu

**Abstract:** Design for additive manufacturing (DfAM) provides a necessary framework for using novel additive manufacturing (AM) technologies for engineering innovations. Recent AM advances include shaping nickel-based superalloys for lightweight aerospace applications, reducing environmental impacts with large-scale concrete printing, and personalizing food and medical devices for improved health. Although many new capabilities are enabled by AM, design advances are necessary to ensure the technology reaches its full potential. Here, DfAM research is reviewed in the context of Fabrication, Generation, and Assessment phases that bridge the gap between AM capabilities and design innovations. Materials, processes, and constraints are considered during fabrication steps to understand AM capabilities for building systems with specified properties and functions. Design generation steps include conceptualization, configuration, and optimization to drive the creation of high-performance AM designs. Assessment steps are necessary for validating, testing, and modeling systems for future iterations and improvements. These phases provide context for discussing innovations in aerospace, automotives, construction, food, medicine, and robotics while highlighting future opportunities for design services, bio-inspired design, fabrication robots, and machine learning. Overall, DfAM has positively impacted diverse engineering applications, and further research has great potential for driving new developments in design innovation.

**Keywords:** design; engineering; additive manufacturing; 3D printing; materials; processes; optimization; mechanics; modeling; applications



**Citation:** Egan, P.F. Design for Additive Manufacturing: Recent Innovations and Future Directions. *Designs* **2023**, *7*, 83. <https://doi.org/10.3390/designs7040083>

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## 1. Introduction

As additive manufacturing (AM) technologies continue to advance, there is a need for design methods to guide innovations that benefit from AM's capabilities for fabricating complex structures with novel materials [1]. Unfortunately, recent research suggests that AM technologies remain underutilized [2]. For designers to achieve AM innovations, they must do more than simply possess AM technologies—both the effective use of resources and information management for decision making are crucial. Design for additive manufacturing (DfAM) provides a framework that facilitates decision making with AM technologies. DfAM is a multifaceted field of study in which diverse topics such as creativity [3], bio-inspiration [4], materials [5], optimization [6], and validation [7] are all considered for enhancing AM design with integrated approaches. Advances in DfAM are necessary to keep up with the exponential increase in interest for AM applications [8], especially in fields such as medicine that benefit from on-demand design and manufacturing for personalized solutions [9]. Here, DfAM research is surveyed by considering perspectives from stages across the design process and discussed for diverse application areas that may foster AM design innovations.

An important aspect of DfAM is the establishment of a framework for learning and implementing relevant tools and techniques for a particular design application. A DfAM product development framework subdivided into the stages of process selection, functional redesign, and optimization has been demonstrated as an effective approach for both research and industry case studies [10]. These stages enable designers to reason about the



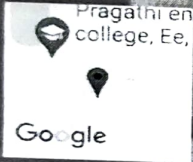
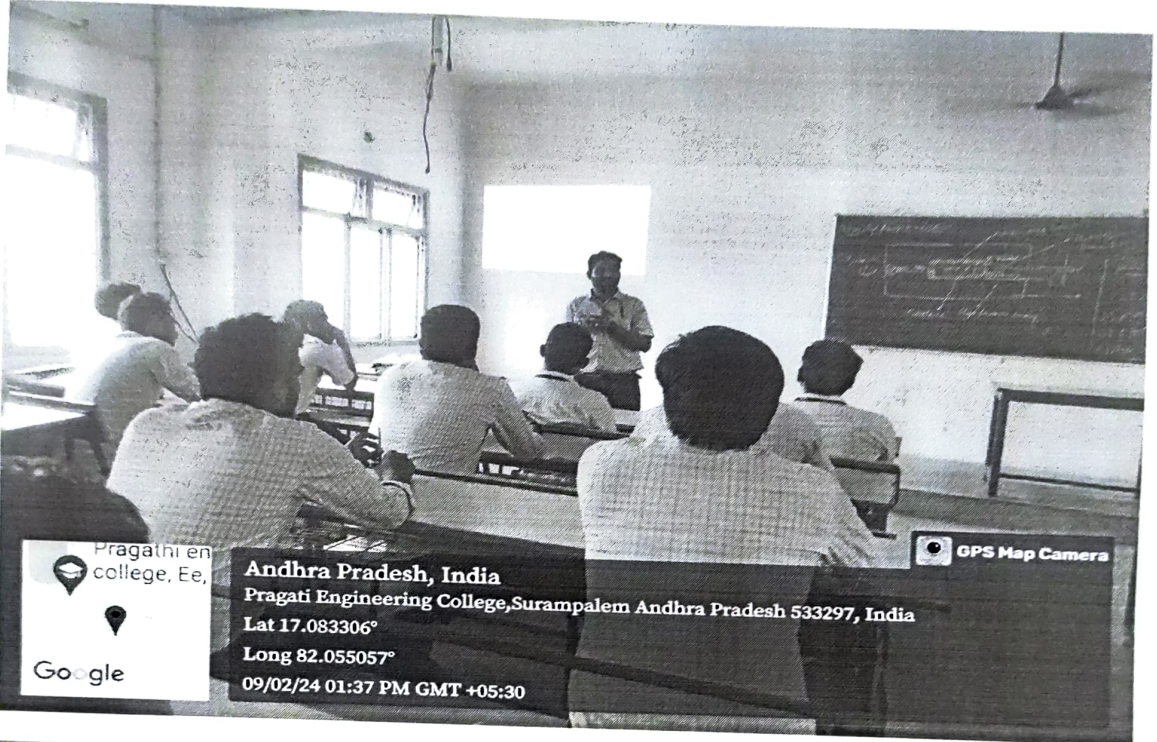
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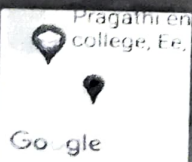
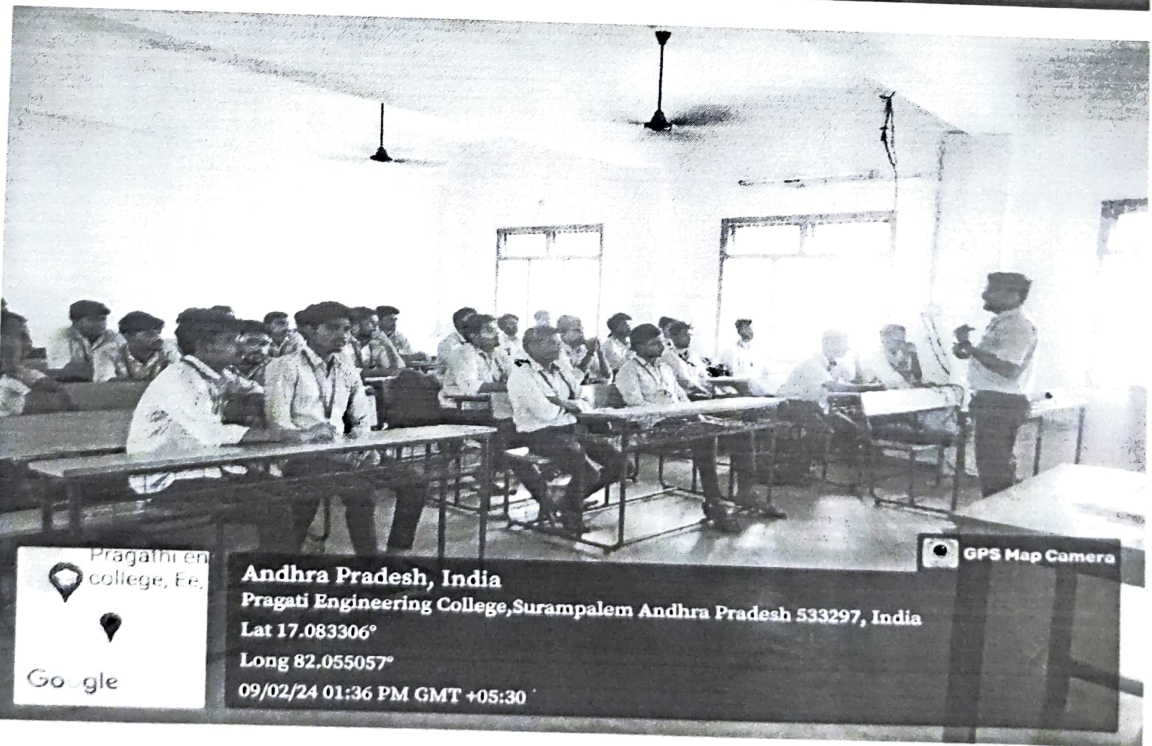
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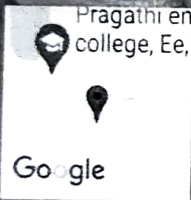
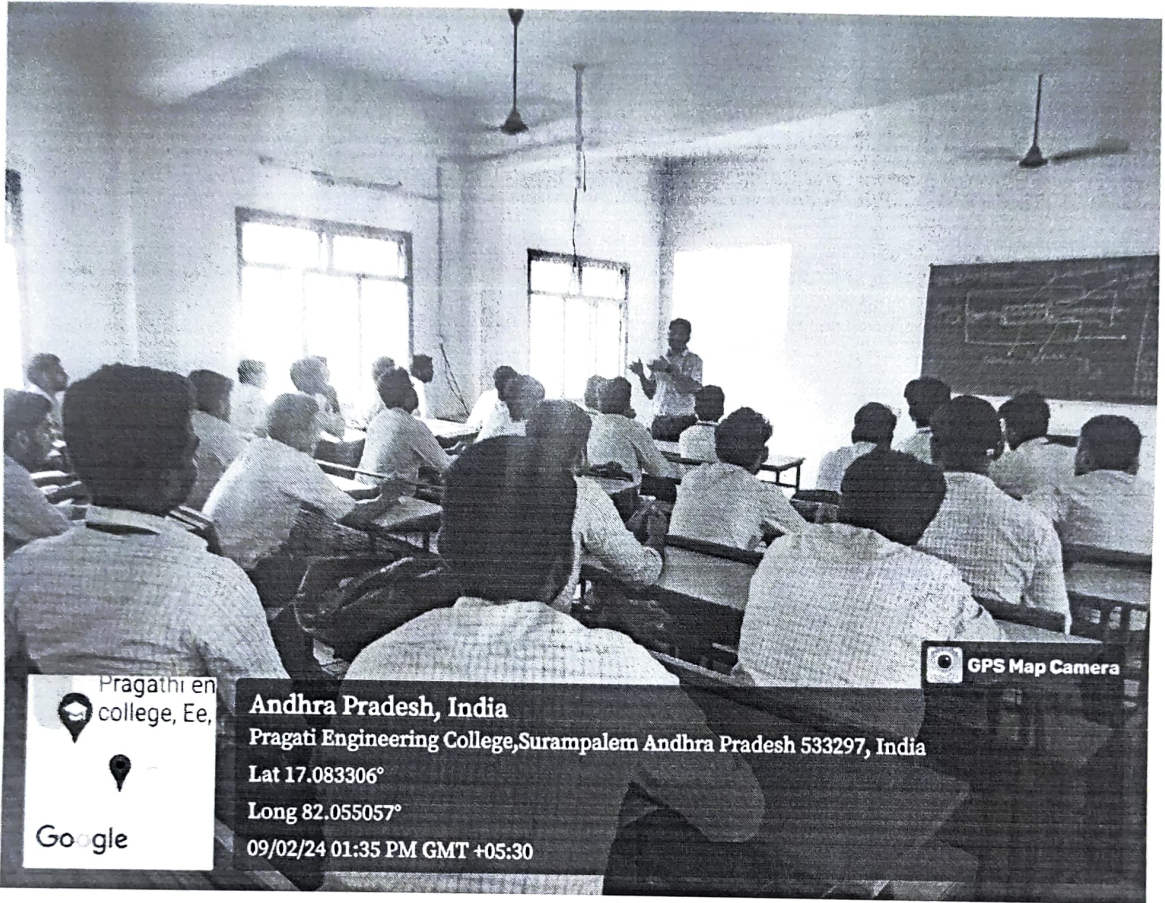
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GPS Map Camera

COORDINATOR



Additive Manufacturing Club

# PRAGATI ENGINEERING COLLEGE (Autonomous)

## STUDENT SESSION FEED BACK

Additive Manufacturing Club Organized By Department Of Mechanical Engineering In Association With Career Guidance Cell

Topic: Design for Additive Manufacturing: Recent Innovations and Future Directions Date : 09/02/2023

INSTRUCTION: - Put  mark in the box

Q1 Indicate the rating of the session as per your Opinion

1. Poor  2. Average  3. Good  4. Very Good  5. Excellent

Q.2 Please provide us with ideas and suggestions if any

THANK YOU for your feedback. Happy Learning!

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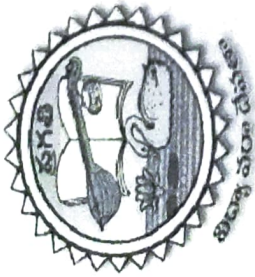
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## Certificate of Participation

*This is to certify that*

**P.Siva Sankari**

*has participated in a Seminar on "Design for Additive Manufacturing: Recent Innovations and Future Directions"*

*under Additive Manufacturing Club*

*Organized by Department of Mechanical Engineering*

*in*

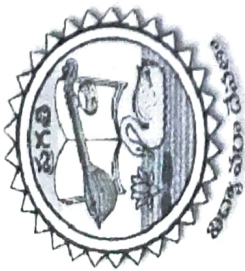
*association with Career Guidance Cell on 9<sup>th</sup> Feb 2023.*

*P. Ram Prasad*

Mr. P. Ram Prasad  
Convener



Dr. G. Avinash  
HOD-ME



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## Certificate of Participation

*This is to certify that*

**R. Raj Kumar**

*has participated in a Seminar on "Design for Additive Manufacturing: Recent Innovations and Future Directions"*

*under Additive Manufacturing Club*

*Organized by Department of Mechanical Engineering*

*in*

*association with Career Guidance Cell on 9<sup>th</sup> Feb 2023.*

*P. Ram Prasad*

Mr. P. Ram Prasad  
Convener



Dr. G. Avinash  
HOD-ME