OM ENGINEERING COLLEGE

Approved by AICTE & Affiliated to GTU

A Report

On

RAPID PROTOTYPING AND ITS APPLICATION

[ADDITIVE MANUFACTURING TECHNIQUIES]

Host:

Mr. Prashantbhai Kadivar
(Trustee - Om Education & Charitable Trust)

Dr. H. M. Nimbark
(Director - Om Engineering College)

Guest of Honor:

Shree Jayant Jamuar
[President ASM]

Chief Guests:

Prof. Harish M. Dalal [Dean, Oakbrook business school, Adalaj]
Shree. A.C.Mathur [President SSME, Division Head, SAC-ISRO]
Prof. V.R.Iyer [Director, Diploma Studies, NIRMA University]

Charmain:

Prof. B. M. Garala
(Department Of Mechanical Engineering)

Organized & Managed
By:
Om Engineering College
Om Education Trust, Junagadh

Date: 21st December 2013 Time: 09:00am to 5:00pm Venue: Seminar Hall

Junagadh-Bhesan Road, At Chokali, Junagadh-362 310. Tel. : 0285-2680500 Fax : 0285-2680666
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Inauguration:

Om Engineering College has set up a milestone combining two practical fields like science and Engineering and arranged a Seminar on Rapid Prototyping and Its Application with the immense help of MECHANICAL DEPARTMENT jointly organizes by Space Society Of Mechanical Engineers (SSME) and Gujatat Technological University, Ahmedabad (GTU) on 21st December 2013 at seminar hall.

Campaigning in different industries and colleges, the seminar got maximum participants from different colleges as well as Industries. The registration desk had begun the procedure at 9:30am in the early morning with breakfast and tea.

The seminar was inaugurated by welcoming the Chief Guest as well as invited Guest of Honor. Om Engineering College offered a warm welcome to all dignitaries and participants.

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These dignitaries were Shree. Jayant Jamuar (President of ASM), Prof. V.R.Iyer (Director, Nirma Univesity), Shree. A.C.Mathur (President SSME), Prof. Harish M. Dalal (Dean, Oakbrook business school,

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Adalaj), Mr. Prashant Kadivar (Trustee, OM Engineering college, Junagadh).

After welcoming all the dignitaries, guests, industrialist, faculty members, Patel Kiragi, Narola Komal, Gauswami Swati the students of Om Engineering College recited SARASWATI VANDANA.

After prayer and inauguration function the anchor has invited Director of Om Engineering College, Dr. H.M.Nimbark sir to enlighten about the activity and creativity of college.

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Dr. H.M.Nimbark [Director, Om Engineering College]

He started his speech with the history and importance of Junagadh in Gujarat to the delegates. He also discussed about the VISION & MISSION of our college i.e. working for better education, research activity of student and work interdisciplinary, development of industrial knowledge of student as well as staff by making industrial tour and training. He suggested our students to cope with global education in India as well as abroad and guide to become a member of SSME and ASME.

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After welcoming session the whole program was handled by Mr. Amit Agrawal, (scientist SAC Division ISRO). He gave brief introduction of ISRO and explained its working. And then he invited Shree A.C.Mathur sir for his presentation.

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Shree. A.C.Mathur [President SSME, Division Head, SAC-ISRO]

A.C.Mathur given his presentation At 10.30 Shree A. C. Mathur started his presentation with the topic "INTRODUCTION OF SSME AND ITS WORKING". In his topic he covered the foundation and development of SSME and its member and various posts offered to them. He also informed about the different departments like mechanical, physics, electronics, civil, metallurgy, structural etc. He also gave information about the rules of membership of SSME. He also highlighted the constitution, salient features and research activities of SSME like the journals of Mechanical Engineering published by SSME are read widespread and are prepared by some of the branches of IIT. SSME also organizes seminars, news bulletins, workshops, expert talks, Demos, publishing journals and lectures.

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Shree Jayant Jamuar [President SSME]

Shree Jayant Jamuar, President of American Society Of Metals and chairman of forging association, previously worked as a director techanical at Kadvani forging, Rajkot started his presentation on "INTRODUCTION OF RAPID PROTOTYPING".

He gave the introduction about rapid prototyping and explained basic working principal of rapid prototyping and its advantages for industries.

He also advised to all faculty members that faculty must be follow the principal KASH not CASH. KASH means

- K = knowledge,
- A = Ability,

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- S = Skill,
- H = Habit.

He explained to faculty as well as students that with help of CAD/CAM softwares and new techniques like RP they are able to do design and manufacturing components very rapidly and efficiently.

Prof. V.R.Iyer [Director, NIRMA University]

Prof. V.R.Iyer, director of Nirma University started his presentation on RAPID PROTOTYPING AND ITS APPLICATION. He is working with in a field of CAD/CAM since past 25 years and regular guide for FEM in ISRO from last few years.

He explained that many industries are approaching the field CAD/CAM and RP . He also suggest to start innovation and research in education system and improve practical knowledge with use of RPT technique and start testing various aspects in design.

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He explained about advantages and disadvantages of Rapid Prototyping Techniques like .

- Easily changed part,
- Higher output for user,
- Cost effective,
- Reduce the product development time,
- And it is not suitable for large application.

He also explained about different fields where RPT can be applicable

1. Form {market}
2. Functionality {engineering design}

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3. Fit {manufacturing}

he also explained steps of RP Technology which are follow:

STEP – 1 : - GEOMETRIC DATA

- CAD packages
- Digitize – Scanners, MRI-S

STEP – 2 : - DATA CONVERSTION

- Convert the all data in STL (standard tessellation language) format

STEP – 3 : - LAYER THICKNESS DETERMINES

- Accuracy
- Build time
- Quality of surface

STEP – 4 : - BUILDING OF PARTS

STEP – 5 : - POST PROCESSING

- Remove post support and polish the models for display functional requirement.

After presentations, On behalf of Om Engineering College Prof. B.M.Garala presented memento to the dignitaries, Shree Jayant Jamuar, Prof V.R.Iyer and Shree A.C.Mathur

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Prof. Harish M. Dalal [Dean, Oakbrook business school, Adalaj]

Prof. Harish M. Dalal , the Dean of Oakbrook business school Adalaj shared his view about 2D and 3D PRINTING.

The main topic discussed by him was follows

- Objective of printing,
- Printing of biological object like engineering Heart valve
- Printing of other components like gitar, flute, high hill shoes, loom, racing car component

He also discussed design concept of 4D printing and also shown video for current features of 4D printing.

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Sh. Ravi Patil [Technical manager, Design tech, Pune]

Mr. Ravi Patil, Technical Manager, design tech, Pune gave his presentation on ADDITIVE MANUFACTURING.

He explained many other innovative techniques related to rapid prototyping like

- Rapid tooling,
- Rapid technology,
- Rapid manufacturing,
- Additive manufacturing,
- Additive fabrication,
- Additive digital manufacturing,
- Direct manufacturing.

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He also Explained the many things for printing technology like

- Concept model,
- Functional prototype,
- Manufacturing tool,
- End use part

He discussed about polyjet technique and FDM technology, he also gave brief idea about rapid fabrication process steps. He also explain many case studies of the industries related to rapid prototyping.

After completion of the presentation memento was given on behalf of Om Engineering College to Prof. Harish M. Dalal and Shree. Ravi Patil by Prof A.G.Makati.

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Sh. Ketan Panchal [Production Manager IGTR]

After lunch break Ketan Panchal, production manager in IGTR gave his presentation on ADDITIVE MANUFACTURING IN METAL AND RAPID PROTOTYPING.

In his discussion he covered following topic

- Why prototyping is necessary?
- Advantages and disadvantages of prototyping,
- RPT application,
- Different processes of RPT like SLA(Streolothiography) , LOM(Laminated object manufacturing),

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He also discussed that how rapid prototyping is useful for investment casting industries. He also discuss use of software for conformal cooling in rapid prototyping process to find out cooling rate which is beneficial for time saving as well as cost reduction in rapid prototyping process. He also discussed materials like stainless steel, hot work steel, nickel based alloy on which RP can be applicable in future

Sh. Sammir Sakhare [scientist, SAC/ISRO]

Shree Sammir Sakhare, senior scientist and project manager in ISRO Ahmedabad, gave presentation on RPT IN PERSPECTIVE.

He further discussed many different topics and give brief idea on rapid prototyping method like

- What is rapid prototyping?
- How RPT work?

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- Basic need of RPT,
- RPT compare to Conventional machines,
- Basic steps of RPT,
- What is additive manufacturing?
- Streolothiography & its silent features,
- Laminated object manufacturing,
- What is 3D printing?

He mainly focused on different topics of rapid prototyping method like

- RP vs conventional machining
- Technological workshop
- Electron beam melting
- Residual stress

He also briefly explained different RP machine parameters like

- Material,
- Cost,
- Resolution,
- Scan speed,
- Build volume.

And at last he also discussed some problem with Rapid Prototyping Techniques like

- Part accuracy,
- Limited variety of material.

After completion of the presentation memento was given on behalf of Om Engineering College to the Shree. Ketan Panchal and Sh. Sammir Sakhare by student coordinator Rahul Patel

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Sh. S.S.Gill [Scientist, SAC/ISRO]

Shree. S.S.Gill, Scientist, SAC/ISRO and Project Manager of MARS MISSION, conduct last session of workshop on APPLICATION OF LASER ADDITIVE MANUFACTURING IN REALIZATION OF SPACE WORTHY HARDWARE IN METAL

In his presentation he covered mostly all topics related to RPT like

- History of rapid prototyping,
- Introduction to layer based technologies features
- Different names of RPT,
- Why additive manufacturing is required in all the field
  - ✓ Short development time sales,

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- ✓ Reduce waste material and cost,

- How RP used in different fields like
  - ✓ Medical technology,
  - ✓ Automotive technology,
  - ✓ Aerospace technology,
  - ✓ Mechanical engineering.
- RPT compare with conventional design

Lastly he explained the different space payload types and latest development in field of MLT

Valedictory Function:

After the completion of last presentation, Mr. B.M.Garala has offered a memento to Sh. S.S.Gill. Mr. B.M.Garala addressed the session with vote for thanks and the event certificates were distributed to all participants.

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Upshot:

It's matter of privilege and milestone that Om Engineering College was chosen as third platform for SSME seminar. Approximate 116 participants have registered their participation with willingness. Attendees were remained present in whole seminar from regional Institutions as well as reputed well known Industries. At the end, curious question of upcoming seminar and an attempt to achievement has lead to a tag of successful seminar.

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