

Session Report Day-1

Name of Speaker: Prof. P. M. Pandey (IIT Delhi)

Session Coordinator: Mr. Binit Kumar and Mr. Vipul Sharma

The five days faculty development programme organized by Department of Mechanical Engineering, G. L. Bajaj Institute of Technology and Management, Greater Noida started on 4th February 2020 at 09.00 am with a welcome note of Dr. V. R. Mishra (Head of the Department, Mechanical Engineering, G. L. Bajaj Institute of Technology and Management) followed by welcome note of Prof. Satish Chand (Professor, M.E Department, G. L. Bajaj Institute of Technology and Management). First Lecture entitled “Additive Manufacturing 3DP Technologies and Application in design and Manufacturing” started at 10.00 am. Lecture was delivered by Dr. Pulak M Pandey (Prof. ME department, IIT Delhi). He initiated his lecture with the significance of design process cycle. He stated that needs of any product decides the design of product i. e. design evaluation is a critical step for manufacturing process. Further he focused that customer feedback plays a vital role in re- design evaluation process. 80 Faculties members from G. L. Bajaj and other nearby Institutes registered their active participation in the FDP. Lecture Session-1 ended at 11.48 am. Lecture Session-II was started at 11.58 am after tea break. In this session, he covered the concept of 3D printing with concept of Sterolithography. He ended his lecture after giving brief overview of application of 3d additive manufacturing in Bio-Medical application especially for clubfoot kid. Lecture session-2 ended at 1 pm for lunch break. The Speaker was presented with vote of thanks by Prof. Satish Chand (Professor, M.E Department, G. L. Bajaj Institute of Technology and Management).



Day 1 (Session III & IV)

Time: 1:30 PM-4:15 PM

Name of Expert: Prof . Arshad Noor Siddiquee (Prof JMI Delhi, India)

Professor Arshad Noor Siddiquee had received postgraduate and doctoral degrees, from IIT Delhi. etc. He have 20 years of career in academics and academic administration contributed to teaching at graduate and post graduate in the field of production engineering at national and international levels. He published more than 60 papers in international and national journals.

Prof. Siddiquee delivered his lecture on “**Friction Stir Additive Manufacturing**”.

Learnings

Prof. Siddiquee started with basics of Friction Stir welding process and its application in Industries. He was described various types welding processes and its application. According to him, mono-crystalline modules have the highest efficiency levels (~15%-25%) in the market today. Whereas, polycrystalline modules have an average efficiency of ~13%-20% and are typically less expensive than mono-crystalline modules. He claimed that approximately 90% of solar modules in the market today are made of silicon (either mono-crystalline or polycrystalline).

Further in his session he explained the utility of Friction Stir welding process as an Additive Manufacturing in current scenario. Lot of example given by Prof. Siddiquee for effectiveness of this process's in current demand of industries.

At the end of session, he concluded by showing recent advancement in Friction Stir welding process as an Additive Manufacturing specifically in India. Vote of thanks was delivered by Dr. Satish Chand (FDP Convener). The session was concluded with happy note from everyone.



Session Report of Day-2

Name of speaker: Mr. Ravi Deshwal (Manager, BHEL Haridwar)

The five days faculty development programme organized by Department of Mechanical Engineering, G. L. Bajaj Institute of Technology and Management, Greater Noida started on 4th Feb 2020 at 10.00 am with a welcome note of Dr. V. R. Mishra (Head of the Department, Mechanical Engineering, G. L. Bajaj Institute) followed by welcome note of Prof. Satish Chand (Professor, M.E Department, G. L. Bajaj Institute).

Day 2 was started at 10:00 AM with an introduction of speaker by anchor. Lecture entitled “Welding of dissimilar Metals like Nickels based alloys with Chromium steel” by Mr. Ravi Deshwal (Manager, BHEL Haridwar). He discussed about the plan of Govt. of India of installing Advanced Ultra super-critical (AUSC) power plants (Capacity = 800 MW, Pressure ≥ 300 kg/cm² and Temperature $\geq 700^{\circ}\text{C}$) by the year 2024. He focused on the manufacturing aspects of different materials and their components. Also he discussed about when joining two different alloys a dissimilar weld is also made if a higher alloy weld metal is deposited as an overlay or is used to join a lower alloy material. Alloy 22 Nickel, chromium, molybdenum alloy has been successfully used to weld dissimilar Nickel based corrosion resistant alloy. At 11:30 AM, all participants went for tea break. After tea Break of 15 minutes, the speaker discussed about some nomenclatures about welding materials and their techniques. The complete session was of more than two and half hours and was highly informative. The Speaker was presented with vote of thanks by Prof. Satish Chand (Professor, M.E Department, G. L. Bajaj Institute).



Day 2 (Session II)

Time: 01:30 PM-04:30 PM

Guest Profile:



Vikrant Chauhan (Founder of 3D Fusion, Noida, Uttar Pradesh, India)

Mr. Vikrant Chauhan, founder of 3D Fusion- an industrial and educational 3D Printing and Product Company stands at the forefront of the fastest moving technology trend: 3D Printing. A Calculated risk taker with a deep tech industry knowledge, he has built a reputation for developing business strategies globally.

With several years of experience in printing industry, he has produced healthy, enduring results for high echelon clients including major printing industries globally. He completed his B.Tech. in 2012 from G.L Bajaj Institute of Technology, Greater Noida and M. Tech in Printing Technology From Manipal University. He has also done M.Sc. in Print & Media Technology from Chemnitz University of Technology, Germany.

His professional experience include:-

Luxexcel, Belgium- 2017-2018 as a Print Strategy Planner in printed ophthalmic lens industry. Only industry in the world to produce ophthalmic lenses using 3D printing.

Holst Centre, The Netherlands 2015-2016 as a Scientific Researcher on Stretchable Printed electronics. A spin off by PHILIPS ELECTRONICS.

Technische Universität Chemnitz, Germany 2016-2017 as a Scientific Researcher on Flexible Printed Solar Cells. Indo- German government funded project.

Focus of the Lecture:

The title of his lecture was “**A comprehensive workshop on Additive Manufacturing and its Eco System**”. He started with stating the difference between 3D printing and 2D printing, how the printing technology came into the existence, its history and later switched to its relevance to eco systems. He discussed few points like:

- The very first commercial **3D printer** was based on a vat photo polymerization technique called 'stereo lithography'.
- This was **invented** by Charles Hull in 1984, who subsequently founded **3D Systems**.

After that he moved on advantages of additive manufacturing which is the speed at which parts can be produced compared to traditional manufacturing methods. **Complex designs** can be uploaded from a CAD model and printed in a few hours. The advantage of this is the rapid verification and development of design ideas. Additive manufacturing machines complete a build in one step, with no interaction from the machine operator during the build phase. As soon as the CAD design is finalized, it can be uploaded to the machine and printed in one step in a couple of hours.

Then lecture moved on types of 3D printing which are

- Digital Light Processing (DLP)
- Fused deposition Modeling (FDM)
- Selective Laser Sintering (SLS)
- Selective Laser Melting (SLM)
- Electronic Beam Melting (EBM)
- Laminated Object Manufacturing (LOM)
- Binder Jetting (BJ)

Mr. Vikrant further revealed that he has been working and training few students of Mechanical Engineering Department of GLBITM.

At the end lecture was concluded with effects and needs of additive manufacturing as well as its effect on our ecosystem.

We wish Mr. Vikrant a huge success in his career.

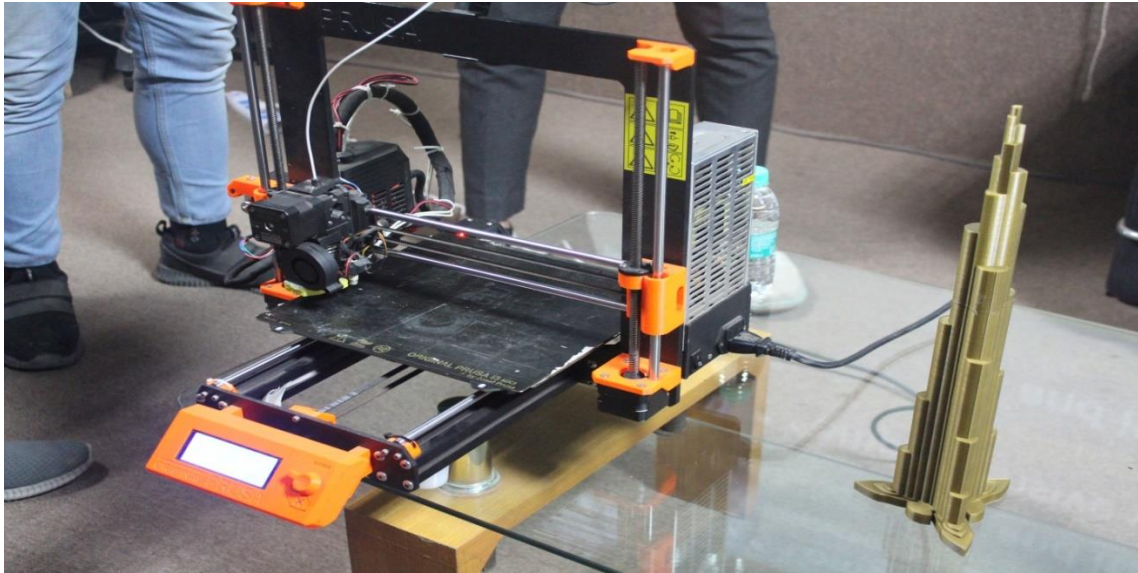


Figure: 3D printed machine with model of Burj Khailfa



Day 3 (Session I)

Time: 10:00 AM-12:45 PM

Prof. D. S. Nagesh (Professor, Department of Mechanical Engineering, DELHI COLLEGE OF ENGINEERING (Now DTU), DELHI, INDIA)



Prof. D. S. Nagesh

Professor D. S. Nagesh had received graduate degree from University of Mysore. His postgraduate and doctoral degrees was from IIT-Kharagpur. He has an experience of 30 years in teaching & research. His research interest is in the field of Robotics, CAD/CAM, Production Automation, Engineering Drawing, Engineering Mechanics, Welding, Application of Artificial Neural Networks, Genetic Algorithm and Design of Experiments. He has published several research papers in journals of repute.

Prof. D. S. Nagesh is Reviewer of various journals like International Journal of Advanced Manufacturing Technology, Journal of Materials and Design, Journal of Engineering Manufacture, Australian Journal of Mechanical Engineering, Proceedings of the Institution of Mechanical Engineers, Proceedings of the I Mech. Part E: Journal, Environmental Engineering and Management Journal and Journal of Risk and Reliability. Some of his achievements with Student Teams as Faculty Advisor are Unmanned Aircraft System that has won \$1500 and the Director's award for the best effort at the AUVSI Student UAS competition at Webster, Maryland, USA. Another project named Unmanned Aerial Vehicle (UAV) secured most innovative design award. Also, a project named CHANDRA RATH won "SAFETY SYSTEM AWARD" at The Great Moonbuggy Race held from 4th April 2008 to 5th April 2008 at NASA, USA.

Apart from this, various project was also developed under his supervision like INTERACTIVE ROBOT FOR ASPERGER SYNDR, SWARM ROBOTICS BASED SYSTEM: SEARCH AND RESCUE MISSIONS, TELE-OPERATED ROBOTIC ARM BASED ON HAPTIC

TECHNOLOGY, GREEN WAYS: DESIGN AND FABRICATION OF AERODYNAMIC BATTERY ASSISTED RICKSHAW, HAND THROW ROBOT.

Prof. Nagesh delivered his lecture on “**ROBOTICS: AN OVERVIEW**”.

Learnings

Prof. Nagesh started with basics of robots and its application in today's scenario. He described that the concept of robot was given by Karel Capek, where the term robot implies 'forced labour'. Basic elements of robots were stated along with different type of joints that exist in any robotic configuration for providing required degree of freedom. Mechanism of different robot configurations like cylindrical, spherical and articulated were discussed along with their type of work volume. Work volume is basically the area a robotic arm can reach. According to him articulate robots are the most useful configuration of robot due to large number of degree of freedom. Then, one of the important part of robot i.e. 'end effector' were explained by him. He described two types of end effectors; grippers and end of arm tooling that are used for performing the allocated task.

Further in the session he explained the kinematics of robots for position and orientation analysis. Two types of kinematics i.e. forward and inverse kinematics of robots with their matrix representation were explained for two types of angles; roll, pitch, yaw angle and Euler angle. Also, he discussed about 'Denavit-Hartenberg' representation of forward kinematic equations of robot that is a simple way of modeling robot links and joints for any robot configuration, regardless of its sequence or complexity. Next, he explained the importance of vision in a robot that is regarded as the most powerful sense that can recover useful information about a scene from its two-dimensional projections. Diffuse, back, structured and directional lighting were some of the illumination techniques that were further elaborated. Apart from this 3rd, 5th and higher order polynomial trajectory planning were also explained.

At the end of session, he concluded by mentioning some of the research areas of robotics like trajectory planning of robots, dynamics problems in robotics and concept of artificial intelligence in robotics. He also showed some of the application of the robots in the field of military, miniature robot that can move within the bloodstream, as a decontaminating robot and as an assistant in micro-surgery.

Day-3 (Session-III & IV)

Time: 1:30 PM- 4.15 PM

Guest Profile:

Mr. Shubham Sharma, is a Sales Manager, General Industry at ABB Gurgaon, Haryana, India. Mr. Sharma completed his B.Tech from Maharishi Markandeshwar University, Mullana – Ambala and MBA from Institute of Management Technology, Ghaziabad. Mr. Sharma have excellent knowledge of Robot technology, consulting, resource planning and customer support services.

A expert lecture on “**Application on Welding Cell Equipment With Robot and Application of Industrial Collaborative Robots to automotive Weldings**” was held on 6th Feb 2019. The expert lecture had been organized by the department of Mechanical Engineering GBITM, Greater Noida. Robot wedding is an emerging technology in the field of Engineering. The expert lecture began with welcome address by Senior Prof. Satish Chandra of the Department of Mechanical Engineering.

Learning

The session was then continued by Mr Shubham Sharma. He started his lecture from very basic concept of robot. Mr. Sharma explained the history of robot and its benefit for society. The numbers of skill jobs are created but labor jobs definitely kill by robot. Robots are used in industry for various applications. They are used likes Seam welding, Arc Welding, MIG Welding, Medical robots, Cow Milking robots, Robot Professor etc. Mr. Sharma agreed that artificial intelligence is set to have a significant impact on society. The robot will also set a significant impact on teaching and learning. The first robot lecturer was introduced in Germany in 2019 and has already started delivering lectures to university students at Philipps University of Marburg. So no doubt robots have a major impact on the job description of academics in universities. The real fact is that robot is creating more Jobs. The industry want skill engineers not degree holder engineers.

The session ended with a hearty vote of thanks and presenting of a memento to Mr. Shubham Sharma by Prof. Satish Chandra in appreciation for shearing his knowledge with students and faculty member. He thanked the Management for providing the platform for shearing his view.

Session Report Day-4

Name of Speakers: **Dr. Dr. V. R. Mishra (HOD, MED, GLBITM)**
Dr. Apurbba Kumar Sharma (Prof., IIT Roorkee)

Session Coordinator: Mr. Rahul Sharma and Mr. Anwer Ahmad

The fourth day of five days faculty development programme organized by Department of Mechanical Engineering, G. L. Bajaj Institute of Technology and Management, Greater Noida was started on 7th February 2020 at 09.15 AM with a lecture by Dr. V. R. Mishra (Head of the Department, Mechanical Engineering, GLBITM). Dr. Mishra discussed about “Industry 4.0 in Indian Context”. His lecture was very informative and highlighted the needs of futuristic demands of industries from Indian context.

The second lecture of fourth day was started at 10.30 am. This lecture was delivered by Dr. Apurbba Kumar Sharma (Prof. ME department, IIT Roorkee) on 7th February 2020 about Microwave Energy: Applications in Manufacturing. He initiated his lecture with the significance of Microwave Energy. About.80 faculty members from G. L. Bajaj and other nearby Institutes registered their active participation in the FDP. At 11.30 am, the tea break was announced and all participants reassembled at FDP venue at 11:45 am. The lecture session by Dr. Apurbba Kumar Sharma ended at 01:15 PM.



Day-4 (Session-IV & V)

Time: 2:00 PM- 4.45 PM

Session Coordinator: Mr. Nagendra Kumar Maurya, Mr. Amardeep

The five-day faculty development program organized by Department of Mechanical Engineering, G. L Bajaj Institute of Technology and Management, Greater Noida started on 4th February 2020 at 10:00 am with a welcome note of Dr. V. R. Mishra (Head of Department) followed by welcome note of Prof. Satish Chand (Professor, ME Department, G.L. Bajaj Institute).

Dr. Akshay Dvivedi (ME department, IIT, Roorkee) delivered a lecture entitled “Hybrid Micro Machining”. He initiated his lecture with the importance of micromachining on manufacturing industries. Further, he has discussed his research on micromachining. About 65 Faculty members from G.L. Bajaj and other nearby institutes have registered and actively participated in this FDP Program. His lecture was really interesting and fruitful for the faculty.





Dr. Sunil Pandey (Professor Mechanical Engineering, JNU)

Prof Sunil Pandey is a Welding Fabrication and Manufacturing Scientist & Consultant. He is currently a Professor of Mechanical Engineering in the School of Engineering at the Jawaharlal Nehru University (JNU). He is known for his contribution in the field of Welding Technology and manufacturing science.

His professional experience include:-

- ◆ Formerly he was Professor in the **Department of Mechanical Engineering** at the **Indian Institute of Technology Delhi**.
- ◆ He is also the **Former Vice Chancellor / Director** of **Sant Longowal Institute of Engineering & Technology (SLIET), Deemed University (CFTI under MHRD), Longowal, District Sangrur, Punjab**.
- ◆ He has developed and established various cost effective and national need based technologies in the field of welding.

Focus of the Lecture:

The title of lecture was **“Indegeneously Developed Innovative Arc Welding Technologies”**. He started his lecture with motivational speech and motivated us with following phrases.

- ◆ Be the leader rather than a follower.
- ◆ Innovate or perish.
- ◆ If they can innovate (Western World) then why can't we?
- ◆ Doesn't want to be a mental slave.

After the speech he started with very basics of the Arc Welding and further enlightened us about the following-

- ◆ **Plasma Enhanced Shielded Metal Arc welding Process (PESMAW)** which can get deeper penetration than simple SMAW.
- ◆ Due to deeper penetration **PESMAW** can replace the use of **Cellulosic Electrode** because cellulosic electrode has a problem of **Hydrogen Embrittlement**.
- ◆ Commercialization of **Plasma Enhanced Shielded Metal Arc welding Process** & Development of **application specific fluxes**.
- ◆ Development of **covered electrode** for under water welding.
- ◆ Development of **tubular electrode holder** which can facilitate addition of alloying elements to the weld pool through hollow tube.

Session Report Day-5

Name of Speaker: Dr. Prof. Sachin Maheshwari (Prof., NSIT New Delhi)

Session Coordinators: Mr. Mukesh Kumar and Mr. Jitendra Kumar Singh

Timing: 01:30 PM to 04:15 PM

The five day faculty development programme organized by Department of Mechanical Engineering, G. L. Bajaj Institute of Technology and Management, Greater Noida started on 4th February 2020 at 10.00 am with a welcome note of Dr. V. R. Mishra (Head of the Department, Mechanical Engineering, G. L. Bajaj Institute) followed by welcome note of Prof. Satish Chand (Professor, M.E).

On last day of FDP (8th February 2020) the last lecture was delivered by Prof. Sachin Maheshwari (Prof. ME department, NSIT New Delhi). Prof. Maheshwari discussed about Rapid Prototyping Technology. Many aspects including different types and uses about Rapid Prototyping Technology were discussed by Prof. Sachin Maheshwari. Faculty members from G. L. Bajaj and other nearby Institutes registered their active participation in the FDP. Lecture of day-5, evening session was ended at 04.15 pm. The valedictory session was started at 04:15 PM and ended at 04:30 PM.

