



AICTE – Training And Learning  
(ATAL) Academy



Sponsored Programme on

**3D PRINTING & DESIGN**

**October 5-9, 2019**



**Organized by**

**Department of Mechanical Engineering,  
IIT(BHU) Varanasi (UP) India 221005**

### **About AICTE's ATAL Programme :**

AICTE Training And Learning (ATAL) Programme is an initiative by AICTE which aims at empowering faculty to achieve goals of Higher Education such as access, equity and quality. This programme is designed to fulfill the need to train the young generation in skill sector and having faculty & technicians to be trained in their respective disciplines. It was felt that Training with latest tools and technologies is vital to keeping an institute competitive and more productive. Training is required for increasing the knowledge and skills of students to make them more employable to acquire global competencies. It also transforms them to harmonize with society and most importantly to make them a good citizen of the country.

### **Objective of ATAL Academy:**

- To set up an Academy which will plan and help in imparting quality technical education in the country
- To support technical institutions in fostering research, innovation and entrepreneurship through training
- To stress upon empowering technical teachers & technicians using Information & Communication Technology
- To utilize SWAYAM platform and other resource for the delivery of trainings.
- To provide a variety of opportunities for training and exchange of experiences. Such as workshops, Orientations, learning communities, peer mentoring and other faculty development programs.
- To support policy makers for incorporating training as per requirements

### **Course Content:**

1. 3D Printing (Additive Manufacturing) Introduction, Process, Classification, Advantages, Additive V/s Conventional Manufacturing processes, Applications.
2. CAD for Additive Manufacturing CAD Data formats, Data translation, Data loss, STL format.
3. Additive Manufacturing Techniques 3.1 Stereo- Lithography, LOM, FDM, SLS, SLM, Binder Jet technology. 3.2 Process, Process parameter, Process Selection for various applications. 3.3 Additive Manufacturing Application Domains: Aerospace, Electronics, Health Care, Defense, Automotive, Construction, Food Processing, Machine Tools
4. Materials 4.1 Polymers, Metals, Non-Metals, Ceramics 4.2 Various forms of raw material- Liquid, Solid, Wire, Powder; Powder Preparation and their desired properties, Polymers and their properties. 4.3 Support Materials
5. Additive Manufacturing Equipment 5.1 Process Equipment- Design and process parameters 5.2 Governing Bonding Mechanism 5.3 Common faults and troubleshooting 5.4 Process Design
6. Post Processing: Requirement and Techniques
7. Product Quality 7.1 Inspection and testing 7.2 Defects and their causes

### **List of Practices:**

1. 3D Modelling of a single component. 2. Assembly of CAD modeled Components 3. Exercise on CAD Data Exchange. 4. Generation of .stl files. 5. Identification of a product for Additive Manufacturing and its AM process plan. 6. Printing of identified product on an available AM machine. 7. Post processing of additively manufactured product. 8. Inspection and defect analysis of the additively manufactured product. 9. Comparison of Additively manufactured product with conventional manufactured counterpart.

**Target Audience :** AICTE approved Institutions-Faculty Members, Research Scholars, Master Research Students and Industry Professionals (on payment basis only @Rs. 10000 pp)

**Venue :** Additive Manufacturing Laboratory, Department of Mechanical engineering, IIT(BHU) Varanasi

**How to Register:** No registration fee will be charged from the participants. Registration in the program is on **First Come First Serve** basis. To register visit & fill: <https://forms.gle/PpLkNox4ZcBzjHBo9>

### **Accommodation:**

Accommodation to outstation participations may be provided in IIT-BHU Alumni -Guest House on nominal charges (subject to availability) on prior request. However participants can use online hotel bookings in varanasi.

### **Speakers:**

Subject experts will be drawn from premier institution like IITs, NITs, IISc and other reputed research institutes /DRDO-CSIR Laboratory etc.

### About Varanasi:

The holy city of Varanasi is the oldest living city in the world which is also known as the Capital of the Spiritualistic world. The city has a great historical and cultural importance. This religious and cultural capital of India is situated at the bank of the holy river Ganges and is famous for temples of Lord Shiva, Buddha (Sarnath) and Sankat Mochan etc. Varanasi is the premiere & mostly place of oriental learning and simultaneously keeping pace with modern advanced knowledge. The vibrant city with its multiple dimensions of knowledge and liberation has a magnetic attraction for people all over the world.

### About Institute:

The Indian Institute of Technology (Banaras Hindu University) owes its existence to Mahamana Pandit Madan Mohan Malviya, Bharat Ratna-the founder of the first residential university of modern India, the Banaras Hindu University. The three of the erstwhile engineering colleges of BHU, namely BENCO, MINMET and TECHNO, were merged to form the Institute of Technology (IT-BHU) in 1968 to provide an integrated educational base. The IT-BHU has been admitting students through the JEE conducted by the IIT's since 1972, and has been consistently ranked amongst the top few engineering institutions of the country. IT-BHU became IIT (BHU) in June 29, 2012 by an Act of Parliament. The Institute has maintained high academic standard since its inception. It has turned out luminary engineers and administrators who served the nation with great distinction. ME department is oldest one which started in 1919.

### How to Reach:

The city of Varanasi is well connected by road, rail and air with all the important cities of India. Regular flights are there from Varanasi to Delhi, Mumbai, Chennai, Hyderabad, Bangalore, Kolkata, Khajuraho and Lucknow. The IIT (BHU) campus is about 12Km from Varanasi Cantt and 20Km from Mughalsarai railway station and 38 Km from the Babatpur (Varanasi) airport.

### \*Course schedule:

Dates	10:00 AM to 11:30 AM	11:30 AM to 12.00 PM	12.00 PM to 1.30PM	1.30 PM to 2:30 PM	2:30 PM to 4.00 PM	4:15 PM to 4:45 PM
Saturday Oct 5, 19	Registration, Inauguration & Over view: 3DP/ADDITIVE MANUFACTURING Prof. S Kumar	High Tea	Session 1 Basics: 3DP/AM by Prof. S Kumar	Lunch	Session 2 CAD for 3DP Prof. OP Singh IIT(BHU)	Tea
Sunday Oct 6, 19	Session 3 AM Techniqies-1	Tea	Session 4 AM Techniqies-2	Lunch	Session 5 AM Techniqies-3	Tea
Monday Oct 7, 19	Session 6 AM Techniqies-4 Prof. S Kumar	Tea	Session 7 AM Techniqies-5 Prof. Karunakaran IIT Mumbai	Lunch	Session 8 AM Techniqies-6 Prof. Imteyaz Ahmad IIT(BHU)	Tea
Tuesday Oct 8, 19	Session 9 AM Laboratory & Prof. S Kumar	Tea	Session 10 AM Materials-1 Prof. S Pandey Marwadi Univ, Gujrat	Lunch	Session 11 AM Equipment Vinod Pandey from ADROIT	Tea
Wednesda y Oct 9, 19	Session 12 AM post pro., quality Inspection ,testing & defect analysis Prof. AD Bhatt MNNIT Alld	Tea	Session 13 Visit to Labs in IIT (BHU)	Lunch	Session 14 Interaction session	Valediction

\*may change

### Patron:

Prof. Pramod Kumar Jain, Director  
Indian Institute of Technology (Banaras Hindu University) India

### Workshop Coordinator :

**Prof. Santosh Kumar**

Professor, Dept. of Mech. Eng.

Indian Institute of Technology (Banaras Hindu University)

Email: [santosh.kumar.mec@iitbhu.ac.in](mailto:santosh.kumar.mec@iitbhu.ac.in)

Ph.: +91 7080794851 (M)