



## Digital Fabrication Training Offered by the FabLab @ STPI Bhubaneswar

### Background:

India has established itself as a strong and leading software services and products hub in the global IT-ITeS arena. India has got all the potential necessary to become a leader in electronics and manufacturing sector too.

Globally, few countries are ahead of India in the field of electronics and manufacturing. When we search for the reason behind this, it emerges that those countries had design thinking deeply rooted in their arts and crafts tradition from ancient times and have been successful in infusing that rich and prolonged tradition of design thinking in arts and crafts into education, in the twentieth century. This resulted in transforming the economy of those countries from being agrarian to manufacturing-based.

India is no less than any other country in the world when it comes to the rich tradition of design thinking from time immemorial. Therefore, it is imperative to make design thinking infused continuously into the different strata of the society to make India a design-thinking and manufacturing powerhouse. Hence the need for FabLabs. FabLabs globally act as the catalysts for inducing and infusing design thinking and provide a means for transforming designs into a reality by fabricating them using various computer-controlled machines. Making access to such sophisticated machines available and affordable to the common man to enable him to transform his design into a reality is the principal aim of setting up FabLabs.

Therefore, with the aim of fostering design thinking and maker culture (*I-can-do-it-myself culture*), STPI has established a FabLab in Bhubaneswar in 2019 with equal contribution from Government of India and Government of Odisha. In order to further promote the design-thinking based maker culture, the FabLab @ STPI Bhubaneswar conducts a bunch of courses for those who have a creative and innovative bent of mind.

### The STPI FabLab & its Capabilities:

The STPI FabLab is a small-scale digital manufacturing workshop offering guidance and support for anyone to design their own product or prototype from the scratch. Following services are provided by the FabLab with its decent set of equipment:

- 3D scanning  
(Sense 3D)
- Moulding and casting  
(Sand blaster, Vacuum pump)
- Laser cutting  
(Epilog Fusion M2 CO2)
- Testing of electronic devices  
(Electronic components, Power supply, Oscilloscope, Function generator)
- 3D printing  
(Sindoh 3DWOX, FormLabs, Stratasys)
- CNC milling  
(Roland SRM 20, ShopBot Router)
- Vinyl cutting  
(Roland DG GS-24)
- Sawing  
(Band saw, Scroll saw)

## Courses Taught:

The courses are offered in a balanced manner to suit the needs of different categories of beneficiaries: 1. a *foundational level* course for beginners who would like to learn just the basics of digital fabrication, 3D design, 3D printing, etc., 2. an *intermediate level* course for those who would like to know the basics of digital fabrication and some more details in depth and those who already know the basics of digital fabrication and would like to get little deeper knowledge about it, and 3. an *advanced level* course for those who would like to gain deeper insight into design thinking and digital fabrication coupled with intensive hands-on experience through a project.

Following are the salient features of the courses:

- The courses are conducted in a professional and entrepreneurial environment in the state-of-art “ELITE” building of STPI in Gothapatna. Gothapatna is an important education hub of Bhubaneswar. The ELITE building houses the famous Electropreneur Park which is a leading ESDM (Electronics System Design and Manufacturing) incubation facility in the country second only to the Electropreneur Park in New Delhi.
- The candidates can interact with the real-world top-notch innovating professionals working in the ESDM and IT-ITeS start-up companies.
- The candidates will get exposed to the international FabLab network.
- Each batch will have a maximum of 12 students.
- **Age and educational qualification will be no bar to taking any of these courses.** However, based on the complexity of each course, the corresponding desirable educational background is mentioned for guidance.
- Theory classes will be complemented by adequate number of practice classes, as digital fabrication is more of hands-on activities.
- The classes are backed by proper courseware.
- Proper certificates will be issued on successful completion of the course.

### A. Foundational Level

S. No.	Module	Duration of Theory Class in Hrs	Duration of Practice Class in Hrs	No. of Working Days
1.	Introduction to Digital Fabrication and its demand	2	1	1
2.	Basics of 2D & 3D designing using Inkscape and Gimp or Corel Draw & Vinyl cutting	6	4	3
3.	Introduction to 3D software & Basic 3D design (SolidWorks / Fusion 360)	10	6	4
4.	Laser cutting and engraving	4	4	2
5.	3D scanning & 3D printing (Sindoh 3D Wox)	6	6	3
	<b>Total</b>	28	21	13
	<b>Overall Duration</b>	<b>3 Weeks</b>		
	<b>Desirable Educational Background</b>	<b>10<sup>th</sup> – 12<sup>th</sup> Std., ITI</b>		
	<b>Fee</b>	<b>Will be updated soon</b>		
	<b>Dates</b>			

## B. Intermediate Level

S. No.	Module	Duration of Theory Class in Hrs	Duration of Practice Class in Hrs	No. of Working Days
1.	Introduction to Digital Fabrication and its demand	2	1	1
2.	Basics of 2D & 3D designing using Inkscape and Gimp or Corel Draw & Vinyl cutting	8	6	4
3.	Introduction to 3D software & Basic 3D design (SolidWorks / Fusion 360)	20	12	8
4.	Laser cutting and engraving	4	4	2
5.	3D scanning & 3D printing (Sindoh 3D Wox, FormLabs, Stratasys)	12	12	6
6.	Casting and moulding	--	8	2
	Total	46	43	23
	<b>Overall Duration</b>	<b>5 Weeks</b>		
	<b>Desirable Educational Background</b>	<b>Polytechnic, Engineering UG</b>		
	<b>Fee</b>	<b>Will be updated soon</b>		
	<b>Dates</b>			

## C. Advanced Level

S. No.	Module	Duration of Theory Class in Hrs	Duration of Practice Class in Hrs	No. of Working Days
1.	Introduction to Digital Fabrication and its demand	2	1	1
2.	Basics of 2D & 3D designing using Inkscape and Gimp or Corel Draw & Vinyl cutting	8	6	4
3.	Introduction to 3D software & Basic 3D design (SolidWorks / Fusion 360)	20	12	8
4.	Laser cutting and engraving	4	4	2
5.	3D scanning & 3D printing (Sindoh 3D Wox, FormLabs, Stratasys)	12	12	6
6.	Casting and moulding	--	8	2
7.	Electronic circuit designing and PCB milling using Eagle/Kikad/EasyEDA/Proteus	20	20	10
8.	3D design using ShopBot Router	4	10	4
	Total	70	73	37
	<b>Overall Duration</b>	<b>8 Weeks</b>		
	<b>Desirable Educational Background</b>	<b>Engineering and Science UG/PG</b>		
	<b>Fee</b>	<b>Will be updated soon</b>		
	<b>Dates</b>			

### For more details, please contact:

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