



# Gujarat Technological University

(Established under Gujarat Act No. 20 of 2007)

## A Report on-Faculty Development Program “Glass Façade Engineering”

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Event Deceleration Circular:

[http://www.gtu.ac.in/uploads/2\\_Circular\\_Faculty%20Development%20Program%20for%20Glass%20Fa%C3%A7ade%20Engineering\(1\).pdf](http://www.gtu.ac.in/uploads/2_Circular_Faculty%20Development%20Program%20for%20Glass%20Fa%C3%A7ade%20Engineering(1).pdf)

Organized under

### **SKILL DEVELOPMENT CENTER**

(GTU-School of Glass Processing Technology)

**Date: October 03 - 07, 2016**

**Time: 09:30 AM to 6:00 PM**

Gujarat Technological University,  
A-1, 2 Conference Hall, Nr.Visat Three Roads,  
Visat - Gandhinagar Highway,  
Chandkheda, Ahmedabad – 382424, Gujarat.

## About GTU – Skill Development Center

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Gujarat Technological University (GTU) is probably the only technological university in our country, which has been making continuous need based interventions to make our engineering curriculum both practice-oriented and design-based, while involving industries actively in the process. It has been working for the development of high-level skills as a part of the educational process.

GTU proposes to establish five Skill Development Centers (SDC) in nineteen trades, which are a part of the engineering curriculum. Thus GTU may establish as many as 95 SDCs by upgrading the workshops of some of the Polytechnics and Engineering Colleges.

The Skill Development programs are being set up on the basis of pedagogical innovations, which GTU has initiated for strengthening technological education through practice orientation, a close inter-action with industries and through project-based and design-oriented learning systems.

The implementation of this vision, in a small part has started igniting the innovative are spirits of the youth at GTU. The need is to equip the youth with the necessary knowledge and skills and to facilitate the progress of thousands of their dreams. This is the kind of vision, which in ten years will make India a significant player in the fields of new technologies and new products and processes for ushering a smarter and more equitable world.

## GTU – School of Glass Processing Technology

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Every Large industry in India has not only to purchase new technology from the developed world. But we do not have the skilled manpower to operate the new technological tools optimally. India's large companies purchase new technologies every year from all over the world.

GTU proposes Skill Development program in new technologies and also encourages development and research activities in those technologies, so that India can become equally advance with the rest of the world when the present technologies are up-graded or when disruptive new technologies are developed. The world is becoming inter-dependent and GTU's program in development of new technologies will ensure that while we may have to import some new technologies, we shall be able to contribute to the world of new developments in an equal measure.

At GTU, the entire program of fostering student start-up, bringing practice-orientation in big way into engineering education, permeating all of the syllabi with design thinking and the Skill Development program are parts of holistic vision. The implementation of this vision, in a small part has started igniting the innovative spirits of the youth at GTU. The need is to equip the youth with the necessary knowledge and skill and to facilitate the progress of thousands of their dreams. This is the kind of vision, which in ten years will make India a significant player in the field of new technologies and new products and processes for ushering a smarter and more equitable world.

With the advent of technology and availability of materials locally, buildings in India have started having extensive amount of glazing-either in the form of façade glazing or in the form of windows. The private

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and Government infrastructure is also witnessing major growth in all parts of the country in which structural glazing plays a vital part of it.

However, while the Building Façade industry has grown very fast, there are gaps in skills in the glass façade and glass processing which has led to poor quality of workmanship, delayed completion and additional costs arising from rework. The more complex site operations are also installation of facades and façade elements require a range of skills and knowledge that are not yet been recognized as specific skill or trade.

With the advent of green technology, green building concept has become very popular. Green building must minimize the demand of non-renewable resources and maximize the reuse, recycling and utilization of renewable resources. Today most of the buildings extensively use Glazing in form of Facade Glazing or in the form of large windows. The installation and Glass processing have emerged as one of the important areas of employment in Gujarat. Gujarat is facing acute shortage of Skill required for glass façade fabrication and installation Technology.

GTU is the only University in India to commence the program in Glass Processing Technology. On 6th February 2015, we started GTU-School of Glass Processing Technology. Initially the training program was of 12 weeks at GTU Gandhinagar campus.

In India today most of the buildings extensively use Glazing in form of Facade Glazing or in the form of large windows. The installation and Glass processing have emerged as one of the important areas of employment in Gujarat.

In order to develop need based skilled manpower in the emerging sector (glass façade, fenestration and glass processing industry), the Glass Academy joined hands with Gujarat Technological University to impart glass façade & processing skills and such other skills to the Diploma/ Degree students of Civil & Mechanical Engineering in the GTU premises. These trained students will be industry responsive and readily employable in the industry.

## FDP on Glass Façade Engineering

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Façade Engineering is the art of resolving aesthetic, environmental and structural issues to achieve the enclosure of habitable space. Today lightness and transparency are properties that both architects and clients try to obtain. This has rapidly increased the use of glass in facades. By using steel as a load bearing structure, it is possible to keep the transparency restricting structures slim. The use of glass in facades causes many problems due to the material properties of glass. Glass differs from other building materials in aspect of being an extremely brittle material and breaking without a forewarning. This material property of brittleness has to be taken into account when designing large glass facades.

The requirements of designing load-bearing structures are normally gotten from either the glass supplier or the producer of glass pane elements, who both are thereby responsible for the strength and functionality of the fastening. This FDP is an industry- academia partnership workshop program scheduled on 3rd to 07th October 2016.

This program, includes industrial visits and sessions by industry experts and certification of participation. Experts from the industry shall handle the training sessions. This initiative is aimed at equipping the Faculty Members with the recent trends, tools and strategies to design a sustainable and energy efficient buildings and to educate the students on the same.

## FACULTY DEVELOPMENT PROGRAM - TRAINING SCHEDULE

| DATE   | TOPIC  | INDUSTRY EXPERT   |
|--------|--|---|
| 03-Oct | Glass - The building material  | Mr. Manish Srivastava, Expert - Sustainability & Innovation   |
|        | Fundamentals of building science involved in glass selection         |   |
|        | Glass & Green Architecture (ECBC, Green Building Rating Systems)     |   |
|        | Glass for segments, safety & fire protection, interiors applications |   |
|        | Innovative Glass Solutions   |   |
| 04-Oct | Glass Fabrication and Systems  | Mr. Mitul Gajjar, Façade Consultant   |
|        | Session on Fire Resistant Glazing                                    | Mr. Rajat/ Mr. Prabhakar - Expert - Fire Resistant Glazing<br>Industry Partner – Mr. Shalin Shah, Mahavir Glass Enterprise, Kheda |
| 05-Oct | Glass Manufacturing Line Visit                                       | Industry Partner – Mr. Ashit Bora, Hifab Aluminum, Sanand.  |
|        | Fabrication Line Visit   |   |
| 06-Oct | Façade design, testing and Applications                              | Mr. Ravi, Expert - Façade Design & Testing  |
|        | Glass interiors and its applications                                 | Mr. Bharat Goel, Expert - Interiors   |
| 07-Jun | Case Studies & Expert Session  | Mr. Varun, Green Building Expert, Ahmedabad   |
|        | Feedback & Evaluation  | Glass Academy Foundation  |
|        | Valedictory & Awarding of certification                              |   |

## Workshop Proceedings

### 03<sup>rd</sup> Oct, 2016: Orientation & Introduction to Glass Technology

On the very first day, after registration, The FDP sessions were started by Glass Academy team. Information on glass in Architecture syllabus in an orientation session was taken by Mr. M Balaji (Chief Sevak, Glass Academy Foundation). After the orientation session, Mr. Manish Srivastava, President, Confederation of Construction Products and Services (CCPS) explained the idea of Glass as building material. He also described about Fundamentals of building science involved in glass selection. He explained the characteristics of glass & how to manufacture and fabricated

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glass. He emphasized on Glass as a sustainable building material and its application in Green architecture and fire protection. Also, he gave knowledge of ECBC (Energy Conservation of Building Code) for promoting energy efficiency in the building sector.

### **04<sup>th</sup> Oct, 2016: Industry Visit – Glass Fabrication & Systems and Session on Fire Resistant Glazing at Mahavir Glass Enterprise, Kheda**

On the 2nd day, a discussion about the experience of the first day was begun and queries of the Faculty Members were solved by the Glass Academy. After discussion, the participants were taken on an industrial visit to Mahavir Glass Enterprise, Kheda. Mr. Bala Aaditya (Lead Sevak, Glass Academy Foundation) gave an introduction of Mahavir Glass Enterprise, Kheda.

Mr. Shalin Shah from Mahavir Glass Enterprise, Kheda discussed about the Skilled Manpower requirement in the Glass Industry and how the GTU School of Glass processing Technology is helpful to Glass industry and students make their career in the glass industry.

Mr. Shalin Shah told that currently there are 200 factories of Glass processing in India. Out of them 24 factories are in Gujarat. After the success of the GTU- School of Glass Technology course, now universities at Nagpur and Rajasthan are also considering to start similar programs in glass processing Technology. Then after all the participants are visited Mahavir Glass Enterprise Plant and practically saw the different glass processes and their applications.

### **05<sup>th</sup> Oct, 2016: Industry Visit –Hifab Aluminum Pvt. Ltd., Sanand**

Again the 3<sup>rd</sup> day started with a discussion about the common experience of the second day. Mr. Bala Aaditya (Lead Sevak, Glass Academy Foundation) gave an introduction of Hifab Aluminum Pvt. Ltd. On Dated: 05<sup>th</sup> Oct, 2016 we visited Hifab Aluminum Pvt. Ltd., Sanand.

Mr. Ashit Bora from Hifab Aluminum Pvt. Ltd. discussed about this FDP and briefed that they are one of the leading suppliers, fabricators and erectors of Architectural Aluminum products such as Aluminum glazing, partitioning and doors and window related work based at Ahmadabad. They are working with most of the leading corporate houses of Ahmadabad.

Hifab Aluminum Pvt. Ltd have biggest production line for uPVC windows in western region. They are producing more than 100 uPVC windows per day and have joined hands with LG Hausys (Korea) & Kommerling (Germany). After that session we visited Hifab Plant and all the participants practically saw how the company manufacture, assembles and dispatch glass windows.

### **06<sup>th</sup> Oct, 2016: Façade design, testing & Applications and Glass interiors & its applications**

Again the 4th day morning session started with a discussion about the common experience of the visit at Mahavir Glass Enterprise, Kheda and Hifab Aluminum Pvt. Ltd., Sanand. On the

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fourth day, Mr. Ravi and Mr. Bharat Goel, explained Façade design, testing, Glass interiors and its applications.

### 07<sup>th</sup> Oct, 2016: Evaluation & Valedictory Ceremony

The 5<sup>th</sup> Day Started After experience sharing session with Mr. Mr. Varun, Green Building Expert, Ahmedabad. He introduced about Indian Green Building Council (IGBC). He mention that the building sector in India is growing at a rapid pace and contributing immensely to the growth of the economy. This augurs well for the country and now there is an imminent need to introduce green concepts and techniques in this sector, which can aid growth in a sustainable manner.

### Glimpses of FDP during Expert Session



Sustainability & Innovation Industry Expert Session by Mr. Manish Srivastava



Façade design, testing and Applications Industry Expert Session by Mr. Bharat Goel



Faculty Members paying attention to speaker

## Glimpses of FDP during the Industry Visit

