Report on Five Days Short Term Training Program (STTP)

on "Advanced Structural Engineering: Hands-On Software Applications from Classroom to Construction"

Organized by:

Department of Civil (Structural Engineering),
School of Engineering and Technology,
Gujarat Technological University, Ahmedabad
Duration: 15th – 19th September 2025

The Department of Civil (Structural Engineering), Gujarat Technological University – School of Engineering and Technology (GTU-SET), successfully organized a Five-Day Short Term Training Program (STTP) titled "Advanced Structural Engineering: Hands-On Software Applications from Classroom to Construction" from 15th to 19th September 2025. The program aimed to bridge the gap between theoretical structural engineering concepts and their real-world applications using advanced computational tools and case-based learning. This training program provided participants with a comprehensive understanding of modern design, modelling, and analysis tools such as SAP2000, MATLAB, and MIDAS Civil, as well as exposure to AI/ML-enabled digital twins, and low-carbon structural solutions relevant to sustainable construction.

Objectives of the Program

The major objectives of the STTP were:

- To enhance conceptual clarity of linear and nonlinear analysis of structural systems.
- To impart practical exposure to software used in design offices and research laboratories.
- To develop competence in sustainability-driven structural design and digital innovation.
- To promote interdisciplinary learning among faculty, researchers, and industry professionals.
- To foster collaborations between academia and industry for future research and development.

Participants

The program received an enthusiastic response, with participants including **faculty members, postgraduate students, and Ph.D. scholars** from GTU. A total of **30 participants** attended the program.

Program Schedule Overview

Date	Time	Session Title / Activity	Resource Person / Organization
15 Sept (Day 1)	10:30 – 01:00	*Session 1:* Linear Analysis of Continuous Beam and Portal Frame	Prof. (Dr.) Jignesh Amin
	02:00 – 04:00	*Session 2:* Hands-on Practice of Nonlinear Static Pushover Analysis using SAP2000	Dr. Kaushik Gondaliya
16 Sept (Day 2)	10:30 – 01:00	*Session 3:* AI & ML-Enabled Digital Twins in Civil Structural Engineering – Future Scope	Prof. Rasik Makwana
	02:00 – 04:00	*Session 4:* Hands-on Design Practices of Residential RCC Building	Er. Yash Shah
17 Sept (Day 3)	10:30 – 01:00	*Session 5:* MATLAB for Matrix Operations	Prof. Mridul Seth
	02:00 – 04:00	*Session 6 & 7:* Bridging Theory and Practice: An Introduction to MIDAS Civil for Structural Analysis	Mr. Yamin, MIDAS R&D
18 Sept (Day 4)	10:30 – 01:00		
	02:00 – 04:00	*Session 8:* Structural Engineering Challenges in a Large, Multidisciplinary Project – IIT Mandi Campus	Er. Ashish Sorathiya, Sakshham Consultants
19 Sept (Day 5)	09:00 – 01:00	*Industrial Visit:* Gujarat Institute of Disaster Management (GIDM) / National Seismology Centre	Dr. K. M. Gondaliya
	02:00 – 04:00	*MCQs, Reflection Journal, Valedictory Session & Certificate Distribution*	–

Key Highlights

- **Day 1:** Introduced fundamental linear and nonlinear structural analysis with hands-on demonstration using SAP2000.
- **Day 2:** Focused on AI-driven structural health monitoring and practical RCC design workflows.
- **Day 3:** Provided training on MATLAB programming for structural matrix computations and modelling using MIDAS Civil.
- **Day 4:** Integrated sustainability into design practice with case studies from large-scale projects and low-carbon solutions.
- **Day 5:** Industrial visit enhanced participants' understanding of disaster management frameworks and seismology applications.

Outcomes

The STTP successfully enhanced participants' abilities to:

- Perform linear and nonlinear static analysis of frames.
- Apply AI/ML principles in structural design and digital twin modelling.
- Utilize advanced structural software for simulation and detailing.
- Integrate sustainability and low-carbon strategies into engineering design.
- Collaborate with industry experts for future innovation.

Feedback

They appreciated the hands-on software sessions, interactive discussions, and real-world project insights shared by eminent resource persons. Suggestions included extending the training duration and incorporating modules on performance-based seismic design and bridge modelling.

Photographic Highlights