

CERTIFICATE COURSE

# NON-INVASIVE TESTING METHODS FOR HISTORIC BUILDINGS

**CPP** | CEPT  
UNIVERSITY



# CPP

CEPT Professional Programs (CPP) bridge the gap between academics, practice, policy-making, and implementation through short certificate courses. The mission of CPP is to support individual and organizational learning by creating opportunities to acquire new skills and capabilities, thus allowing professionals to stay relevant in the current knowledge-based global context. It will achieve this by offering professional development, continuing education, and up-skilling opportunities for professionals and in-service persons across disciplines concerned with urban development and the built habitat.

CPP draws from the expertise and capacity of the accomplished faculty at CEPT University, enhanced further by experts and practitioners from the field. Its programmes are built on deep research, vast consultancy projects and innovative pedagogies. CPP offers a repertoire of short courses and topic-focused programs across disciplines of architecture, design, planning, and management with immersive learning approaches combining interactive lectures, case studies, and peer-to-peer exchanges.



## **ABOUT THE COURSE**

This 5-day course on 'Non-Invasive Testing Methods for Historic Buildings' is designed as a workshop for participants to develop the skill of conducting Non-Destructive Tests (NDT) and Minor Destructive Tests (MDT) for historic buildings through hands-on engagement. NDT and MDT methods of material investigation are imperative for retaining maximum historic fabric, while providing useful information regarding the building material and structure. The course will be held at CEPT Conservation Site School in Ahmedabad or Dharmaj, which are presently under the custodianship of Center for Heritage Conservation (CHC), CEPT Research and Development Foundation (CRDF).



## COURSE STRUCTURE

The 5 day skill based workshop involves the basics of non-invasive testing methods for historic buildings along with an introduction to mapping conditions like water ingress, geometric survey, and assessment methods. The course will involve hands on work with the NDT/ MDT equipment and an exposure to specific tests to be conducted for selected historic building materials. The course will enable participants to develop skills for preparing scoping reports for non-invasive testing and undertake investigations for historic buildings and structures.

### **Session 1:** Scoping the site

In this session, the exercise includes on-site identification of various factors that helps in determining the scope of NDT and MDT. The participants shall carryout geometric survey of the site in order to understand the change in levels, deflections or indication of settlement. This shall be followed by complete condition mapping of the site and understanding water ingress paths and critical areas.

### **Session 2&3:** On-site NDT/MDT execution

The participants shall engage with NDT/MDT equipment such as Ultra Sonic Pulse Velocity, Rebound hammer, Ground Penetrating Radar, Boroscope, Rebar detector, Moisture meter etc. The participants shall get hands-on experiences of identifying areas to be tested, surface preparations, sequence of testing, operating NDT/MDT equipment, understanding the challenges of execution and interpretation of the results.

### **Session 4:** Tests at CEPT Laboratory

In session 4, the Minor destructive test core cutting samples shall be tested for their mechanical properties at CEPT Laboratory. The participants shall also observe the cores for their physical characteristics under microscope at the CEPT Conservation Laboratory. The results will help participants get accurate quantified strength of the material used at the historic site.

### **Session 5:** Input Sessions by guest experts

Final Day shall incorporate series of input lectures from guest speakers discussing the aspects of use of non-invasive methods of testing for historic sites. These input sessions will throw light on the topics such as an Overview of NDT/MDT, special case studies, precautions and challenges of non-invasive test application, overall summary of the workshop and a way forward.

## COURSE INSTRUCTORS



**ASHNA PATEL**  
Course Faculty

Ashna is a practicing architect and academic. She holds an undergraduate degree from CEPT University and MA in International Architectural Regeneration and Development from Oxford Brookes University, UK. She has been a visiting faculty at the Masters in Conservation and Regeneration program, Faculty of Architecture, CEPT University since 2018 and has previously taught Design Studios and Architectural History and Theory courses at Navrachana University and MSU, Vadodara. She presently works with CHC as coordinator for Dharmaj Heritage Collaborative, a joint initiative by CHC and Avichal Heritage Foundation to safeguard the cultural heritage of Dharmaj.



**NIGAR SHAIKH**  
Course Faculty

Nigar Shaikh is a conservation engineer with a Bachelors in Construction Technology (Hons.) from Faculty of Technology, CEPT University, Ahmedabad. She holds a MSc in Advanced Structural Analysis of Monuments and Historic Construction (SAHC), a double degree course from University of Minho, Portugal and Czech Technical University, Czech Republic. She has worked on projects like the restoration work of City palace and Zanana Hospital in Udaipur, Laxmi Villas Palace in Vadodara, etc. She is currently working as the Conservation Laboratory In-charge at CEPT University and Research Associate at Center for Heritage Conservation (CHC), CEPT University. Her area of interest lies in risk assessment of built heritage, structural health monitoring, material characterization and working on reverse engineering of historic building materials.



**KHUSHI SHAH**  
Guest Speaker

Khushi is a Conservation Architect from Ahmedabad, India with 19 years of work experience in the field of Architectural and Urban Conservation. She has a B. Arch from The M. S. University of Baroda (2002), and Specialization in Heritage Conservation (DSA-Architecture and Patrimoine) from Centre des hautes études de Chaillot, Paris (2007). Her key work and research interests include built heritage documentation and conservation, traditional building materials and historic settlements. Along with her professional practice as a consultant on varied projects she is also involved in academics as a visiting faculty at FA, CEPT University since 2010.



**DR. AANAL SHAH**  
Guest Speaker

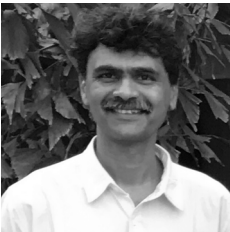
Aanal is a Professor and Acting Dean at the Faculty of Technology and the Program Chair of Structural Engineering Design. She was also the Director of Diploma Certificate office for almost six years, under which CEPT's prestigious Summer Winter Schools are offered. She holds post-graduation in Structural Design from CEPT University. Promoting the development of sustainable alternatives for building materials, she has received a PhD in the area of Geo-polymer concrete from CEPT University.





**DR. ARUN MENON**  
Guest Speaker

Arun Menon, Associate Professor of Structural Engineering at IIT Madras, holds a first degree in architecture, and Ph.D. in earthquake engineering from University of Pavia, Italy. His research interests are in structural aspects of historical constructions, earthquake behaviour of historical masonry structures and earthquake-resistant structural masonry, and he has authored/co-authored in these areas in about 75 technical articles. He currently coordinates the activities of National Centre for Safety of Heritage Structures (NCSHS), a Ministry of HRD (Govt. of India) -supported research centre at IIT Madras.



**MEHUL SHAH**  
Guest Speaker

Mehul R Shah has been working as a Structural Engineer after completing his master's in CASAD. He was a core faculty member at the School of Building Science and Technology, CEPT University, and then continued as a visiting professional in different faculties at CEPT University, mainly involved in guiding students in the area of structural concepts and earthquake-resistant design. He is also a visiting faculty at National Forensic Sciences University teaching students of the Forensic Structural Engineering Master's programme. He is involved as a Professional in the area of Earthquake Structural Engineering, investigation, repairs, and rehabilitation of structures, and structural conservation of heritage structures.

## COURSE CALENDAR

| Session                | Description  | Hrs | Mode               |
|------------------------|--|-----|--------------------|
| Session 1<br>26-7-2022 | SCOPING THE SITE<br>Geometric Survey, Condition Assessment, Water Ingress & Mapping of Conditions, , Problem Areas and need for NDT  | 6   | On-site            |
| Session 2<br>27-7-2022 | ON-SITE NDT/MDT EXECUTION<br>Hands on experience with NDT Equipment - UPV rebound hammer, GPR, borescope, rebar detector, moisture meter, crack meter, etc   | 6   | On-site            |
| Session 3<br>28-7-2022 | ON-SITE NDT/MDT EXECUTION<br>Hands on experience with NDT Equipment - UPV rebound hammer, GPR, borescope, rebar detector, moisture meter, crack meter, etc   | 6   | On-site            |
| Session 4<br>29-7-2022 | TESTS AT CEPT LABORATORY<br>Hands on experience with selected tests such as mechanical tests on core samples at CEPT Conservation lab  | 2   | On-campus          |
| Session 5<br>30-7-2022 | INPUT SESSIONS BY GUEST EXPERTS<br>on principles, precautions and special cases along with summary of findings. <ul style="list-style-type: none"> <li>• Dr. Aanal Shah: Non-invasive testing methods and their application</li> <li>• Khushi Shah: Challenges of implementing Non-invasive testing methods on historic structures and points to be adhered.</li> <li>• Dr. Arun Menon: Case Studies of Non-Invasive Test Methods in Built Heritage Conservation</li> <li>• Mehul Shah: Testing of Timber Elements. A discussion through case studies</li> <li>• Nigar Shaikh: Summary of the Workshop</li> <li>• Ashna Shah: Way Forward for the CEPT Conservation Site School</li> </ul> | 4   | On-campus & Online |



# ADMISSIONS AND APPLICATIONS

|                            |  |
|----------------------------|--|
| Application Process        | <p>Online applications will commence on 25th June 2022. To apply to the course visit the CPP website <a href="http://cpp.cept.ac.in/">http://cpp.cept.ac.in/</a></p> <p>Applicants should complete the online form and attach their CV/resume along with their work portfolios.</p>  |
| Application Deadline       | July 12 2022   |
| Program Commences          | July 26 2022   |
| Prerequisites              | The course is open to students and young professionals of civil and structural engineering, and heritage conservation.   |
| Fees                       | INR 20,000   |
| Certificate and Evaluation | <p>Participants will receive a certificate on successful completion of the course.</p> <p>Evaluation of the workshop will be done basis of the following criteria:</p> <ol style="list-style-type: none"><li>1. Journal to be submitted that incorporates the scoping factors, selection of tests, procedure, challenges, results, observations and interpretations.</li><li>2. Based on the reading material and hands-on experience, a test quiz shall be organized post the workshop.</li></ol> |



Kasturbhai Lalbhai Campus  
University Road, Navrangpura  
Ahmedabad - 380009, Gujarat, India.

 [cpp@cept.ac.in](mailto:cpp@cept.ac.in)

 <http://cpp.cept.ac.in/>

 [@cpp.cept](https://www.instagram.com/cpp.cept)

 [CEPT Professional Programs](#)