CERTIFICATE COURSE

NON-INVASIVE TESTING METHODS FOR HISTORIC BUILDINGS

CPP | CEPT UNIVERSITY

Photo taken by CHC, CRDF team, during batch 1 of the course

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 programs 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 Tankshal ni Pol in Ahmedabad which is presently under the custodianship of Center for Heritage Conservation (CHC), CEPT Research and Development Foundation (CRDF).

COURSE STRUCTURE

This 5-day workshop will introduce the participants to the basics of Non-Destructive NDT and MDT methods for historic buildings along with an introduction to mapping conditions like water ingress and settlement, 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. Principles of non-destructive testing along with advantages and disadvantages will be discussed. The course will enable participants to develop skills for preparing scoping reports for non-invasive testing and undertake investigations for historic buildings and structures.

The five days are planned in detail to enable the identified learnings:

Session 1: Scoping the site
In this session, the exercise will include on-site identification of various factors that help in determining the scoping of NDT and MDT. The participants will carry out geometric survey of the site in order to understand the change in levels, deflections or indication of settlement. This will be followed by complete condition mapping of the site and understanding water ingress paths and critical areas. Selection of non-invasive method will be done based on the outcomes of these exercises.
Guest Input Session: Khushi Shah

Session 2&3: On-site NDT/MDT execution
In the second and third sessions, the participants will engage with NDT/MDT equipment such as Ultra Sonic Pulse Velocity, Rebound hammer, Boroscope, Rebar detector, Moisture meter etc. The participants will 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, structural health monitoring and mechanical crack meter data analysis.
Guest Input Session Day 2: Mehul Shah
Guest Input Session Day 3: Dr. Arun Menon

Session 4: Tests at CEPT Laboratory

In the fourth session, the minor destructive test core cutting samples will be tested for their mechanical properties at CEPT Laboratory. The participants will 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: Analysis of the results, input session on special cases along with a summary of findings and way forward

The final session will incorporate input lectures discussing varied aspects of use of non-invasive testing methods for historic sites. These will include topics such as an overview of NDT/MDT and their use, case studies of historic sites where NDT/MDT have been executed, precautions and challenges on-site for non-invasive test application, overall summary of the workshop and the way forward.
Guest Input Session: Mehul Shah

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COURSE INSTRUCTORS

NIGAR SHAIKH
Course Faculty

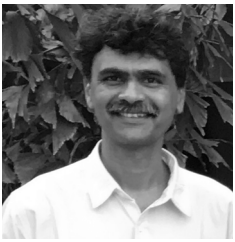
Nigar Shaikh is a conservation engineer with a Bachelors in Construction Technology (Hons.) from Faculty of Technology, CEPT University. She holds an MSc in Advanced Structural Analysis of Monuments and Historic Construction (SAHC), a double degree course from University of Minho, Portugal and Czech Technical University. She has worked on projects such as 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 as Research Associate at Center for Heritage Conservation (CHC). 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.

ZEUS PITHAWALA
Course Faculty

Zeus Pithawalla is a Conservation Architect who currently works at Center for Heritage Conservation, CEPT University. He is also the co-ordinator at CEPT Conservation Site School at Tankshal ni Pol Masjid, Ahmedabad. His experience extends to policy, design, and planning interventions for heritage sites through assessments, exhibitions, reports, publications, and short films. Zeus has been a Teaching Associate at the Faculty of Architecture, for Urban Regeneration Studios, a Conservation Frameworks Studio, and a course on Case Studies. He graduated with an M.Arch (Conservation and Regeneration) from CEPT University in 2020. His thesis undertaken with the University of York won the Best Capstone Project. Zeus won a Gold Medal in the ‘Indian Domestic Contest, ACARA’15’ and went on to represent India. Zeus has worked with Flying Elephant Studio (Bangalore), Museum Art Conservation Center at CSMVS and Design Guidance (Mumbai).

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 M. S. University, Baroda (2002), and Specialisation in Heritage Conservation (DSA-Architecture & 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.



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 program. 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.

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 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. He was an Expert Member on the International Coordinating Committee (BICC) for the UNESCO World Heritage Site of Bagan, Myanmar, and currently is a Member, Expert Advisory Group to International Conservation Committee (ICC) for Vat Phou UNESCO World Heritage Site in Laos PDR. He has been involved in conservation projects in India (Rashtrapati Bhawan, Sun Temple - Konark, IIM, Ahmedabad, Madurai Meenakshi Temple), Bhutan (Tango Monastery, Wangdue Phodrong Dzong), Myanmar (Bagan) and Philippines (San Sebastian Basilica, Manila).

COURSE CALENDAR

Days	Description	Hrs	Mode
Day 1 8 Nov '22	**Scoping the site** Geometric Survey, Condition Assessment, Water Ingress and Mapping of Conditions, Problem Areas and need for NDT Guest input session: Ms. Khushi Shah	6	On-site
Day 2 9 Nov '22	**On-site NDT/MDT execution** Hands on experience with NDT Equipment - UPV rebound hammer, borescope, rebar detector, moisture meter, crack meter, etc at Site School -Tankshal ni Pol Masjid. Guest input session: Mr. Mehul Shah	6	On-site
Day 3 10 Nov '22	**On-site NDT/MDT execution** Hands on experience with NDT Equipment - UPV rebound hammer, borescope, rebar detector, moisture meter, crack meter, etc at Site School - Tankshal ni Pol Masjid. Guest input session: Dr Arun Menon	6	On-site
Day 4 11 Nov '22	**GPR Demonstration and Tests at CEPT** Laboratory. Hands on experience with selected tests such as mechanical tests on core samples at CEPT Conservation lab.	2	On-campus
Day 5 12 Nov '22	**Analysis of the results, special cases along with summary of findings and way forward** • Mehul Shah: Testing of Timber Elements. A discussion through case studies • Nigar Shaikh: Analysis of the results and summary of the • workshop • Zeus Pithawala: Way Forward for the CEPT Conservation Site School.	4	On-campus

ADMISSIONS AND APPLICATIONS

Application Process	Online applications will commence on 13th September 2022. To apply to the course visit the CPP website http://cpp.cept.ac.in/ Applicants should complete the online form and attach their CV/ resumes.
Application Deadline	4th October
Course Dates	8th November to 12th November 2022
Who should apply?	1. Civil engineering and structural engineering students interested in heritage conservation. 2. Practicing architects, heritage conservation professionals and other professionals in the field of cultural heritage conservation. 3. Master's students of conservation interested in learning through hands-on engagement at conservation sites.
Fees	INR 20,000/- + GST (The fees include lunch and tea on all 5 days of the course)

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Certificate & Evaluation	Certificate will be awarded by CEPT University (Participation Certificate / Completion Certificate) Completion Certificate will include evaluation. 1. **Journal**: Demonstration of understanding gained and reflection on aspects of the workshop such as the scoping factors, selection of tests, procedure, challenges, results, observations, and interpretations in a short 8-10 page journal that will be submitted by the participants within a week of completion of the workshop. 2. **Quiz**: Demonstration of the understanding gained in the workshop through a test quiz organized online within a week of completion of the workshop. The quiz will be in a Multiple Choice Question (MCQ) format. Questions in the quiz will be based on the reading material provided and the participants' hands-on experience during the workshop.

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