



PROGRAM BROCHURE

2023

**M.TECH STRUCTURAL
ENGINEERING DESIGN**

FACULTY OF TECHNOLOGY

CEPT
UNIVERSITY

FACULTY
OF TECHNOLOGY



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Emerging Trends in Structural Engineering Design

The demand for innovative, safe, and cost-effective infrastructure has increased exponentially over the last decade. Governments across the globe are providing policy and financial support through various national schemes and initiatives, to effectively meet these demands. The delivery of functional and economical infrastructure today, requires structural engineers to be able to combine the science of construction with the art of designing.

The focus of structural engineering has moved beyond simple physical and material studies and calculations to envisioning creative ways to realize complex geometries and systems. Thus, the scope of education in structural engineering must include an awareness of design concepts in addition to technical knowledge. Engineers must also develop the capacity to solve problems, provide innovative solutions, communicate, and collaborate with professionals such as urban planners, designers, and architects.

About CEPT University

CEPT University focuses on understanding, designing, planning, constructing and managing human habitats. Through its education, research and advisory activities, it strives to improve the impact of habitat professions in enriching the lives of people in India's villages, towns and cities.

The University comprises five faculties— **Faculty of Architecture (FA), Faculty of Planning (FP), Faculty of Technology (FT), Faculty of Design (FD) Faculty of Management (FM).**

Faculty of Technology at CEPT University

CEPT established the School of Building Science and Technology (SBST) in 1982 that focuses on issues concerning construction & management of human habitats and cities. SBST has now been renamed as Faculty of Technology (FT).

FT offers a five years' undergraduate program in **Bachelor's in Civil Engineering (Honours)**. The erstwhile program of Bachelor's in Construction Technology (BCT) is now restructured as Bachelor's in Civil Engineering (BCE) from the Academic year 2023-24. Postgraduate programs offered at FT include **M.Tech. in Construction Engineering & Management (MCEM), Structural Engineering Design (MSED), Geomatics (MGeo) and Building Energy Performance (MBEP).**

Master's in Structural Engineering Design

In the recent era, a wide gamut of ambitious structures are being designed in the world. Structural Engineering aims to connect the demands of geometry, materials and forces for various types of structures. The Master's in Structural Engineering Design Program (MSED) at CEPT University is a reputed program that attracts civil engineers interested in the profession of structural engineering.

MSED is a pioneering program that offers studio pedagogy wherein live projects under various categories are solved, designed and detailed by students under the guidance of faculty members. The range of structures designed by students include low and high rise residential and commercial buildings, bridges, water tanks, industrial structures such as chimneys, silos and marine structures. The faculty in the program comprises highly experienced academicians with excellent academic and professional vigor. Apart from the full-time faculty members, visiting professors and practicing professionals from the industry regularly teach studios and courses bringing practical experience to the classroom.

One of the major objectives of the program is to develop competent structural engineers who are industry ready to work in the profession. The graduates of this MSED program are either placed at leading consulting firms or have also started their own practice.

Dean's Message



Dr. Aanal Shah

Acting Dean
Program Chair

As Dean...

CEPT University offers teaching programs, aimed to build thoughtful professionals, where the students are engaged with studios offering well-designed life-like problems. This objective is realized by collaborative work of eminent practicing professionals and faculty members at the university. It provides a nurturing environment to the students to learn new skills and gain practical experience giving access to latest software and workshops along with multi-disciplinary learning opportunities.

The program equips students with the advanced knowledge and conceptual understanding of the core areas such as concrete, steel, masonry, timber and composite structures; dynamic impact and earthquake engineering; special structures – bridges, silos, chimneys, marine structures, industrial structures and heavy duty structures; foundation engineering, structural analysis and computation; repairs and restoration of structures.

The program sharpens the research skills of the students to provide a competitive edge while embarking on their career. The program also has excellent links with industry which enhances professional skills and improves employability chances of the students.

Program Chair's Message

As Program Chair..

The MSED program was conceived with an aim of providing students with sound principles of structures and their application in real world design problems. With a unique blend of theory, practice and studio based learning, it offers unparalleled excellence through the rich array of courses designed by core faculty members and practicing professionals. Starting from elemental level design to system level design along with detailing of structures, our students are exposed to this rigorous journey through models, discussions and problem-solving approaches incorporating national and international standards. The graduates from this program have embarked upon the professional journey as entrepreneurs, design engineers and academicians. With a combination of sound analytical background and practical approach, every student of this program is well equipped with the required professional skills.

At CEPT University, students have the opportunity to engage with professionals from other fields such as architecture, planning, management, and design. It fosters an environment of collaboration and interdisciplinary thinking, and students can also participate in exchange programs, national and international seminars, workshops and summer schools pertaining to the structural engineering industry.

Core Competencies

The MSED program thrives to cultivate engineering proficiency of the students in line with the ever-changing demands of the profession. The studios and mandatory courses of the program elicit the critical thinking of the students to face the challenges, seek opportunities and solutions for a given problem with innovative as well as integrative technologies in structural engineering and construction.

The graduates of this program can develop the optimized structural systems, analyze, design and detail the structures at a professional level. They are trained to visualize the flow of the forces and arrive at the solution keeping in mind the safety and serviceability of any structure. Through the strong mathematical calculations and reasoning capability, they can justify the final proposed design of a structure.

The role of structural engineers in the construction industry is changing to meet the demands of the future. The learning pedagogy of the MSED program is designed to provide professionals with transferable skills such as problem-solving, innovation, communication, and collaboration, as well as the technical and domain knowledge they will need to address the sector's problems and changing dynamics.



Course Pedagogy

The MSED program is centered on Studio-based teaching and learning pedagogy. Students are assigned live building projects straight from the architect's office and they work as professional structural designers from the first day of the course. The complexity is introduced at the later semesters, where the heavy duty industrial projects are assigned with mechanical drawings and process requirements. The live bridges are also designed by the students in the final semester. Studio pedagogy ensures that each student is doing individual analysis, design and detailing of the given projects for each semester. Studios comprise of 75% of the credit requirement and hence they demand much rigor and depth throughout the tenure of the course. Faculty and Teaching Assistant to students' ratio is 1:8 for all the studios, which ensures personalized guidance to each student. Apart from the full-time faculty members, visiting professors and practicing professionals from the industry regularly teach studios and courses bringing practical experience to the classroom. Additionally, on-site learning is encouraged through visits and field trips.

To view student's work, go to: <https://portfolio.cept.ac.in/>



Course Structure

The two-year program leading to award of Master of Technology in Structural Engineering Design aims to train students in practical art and philosophy of structural design. The SED program focuses on building professional capacities and therefore, they are concentrated on 'studios' wherein all students work on live projects and come up with their own transformed structural systems, analysis and design.

Total: 80 credits

Studio: 12 credits each, Mandatory courses: 3 credits each.

Thesis/DRP: 14 credits

Others (Electives + SWS): 12 credits

SEM	STUDIOS (12 Credits)	MANDATORY COURSE (2 Credits each)
1	Structural forms and Materials	<ul style="list-style-type: none"> Advanced methods of structural analysis Evaluation of failures, repairs and rehabilitation of structures Communication and Writing.
2	Design of reinforced concrete structures	<ul style="list-style-type: none"> Earthquake engineering Wind Engineering Advanced Geotechnical engineering
3	Design of steel structures	<ul style="list-style-type: none"> Design of Chimneys Design of Silos Design of Liquid retaining structures.
4	<ul style="list-style-type: none"> Design of Bridges and /or Parametric Modelling and Design of Long Span Structures 	

Electives & Summer Winter School

CEPT University cherishes the individual interests and abilities of its students. Students get a chance to chart their own learning paths by completing a portion of their credits by choosing from a wide range of elective courses offered at any of the five faculties at the University. It gives them a greater exposure to a wide range of disciplines related to built-environment and an opportunity to collaborate on a multi-disciplinary campus.

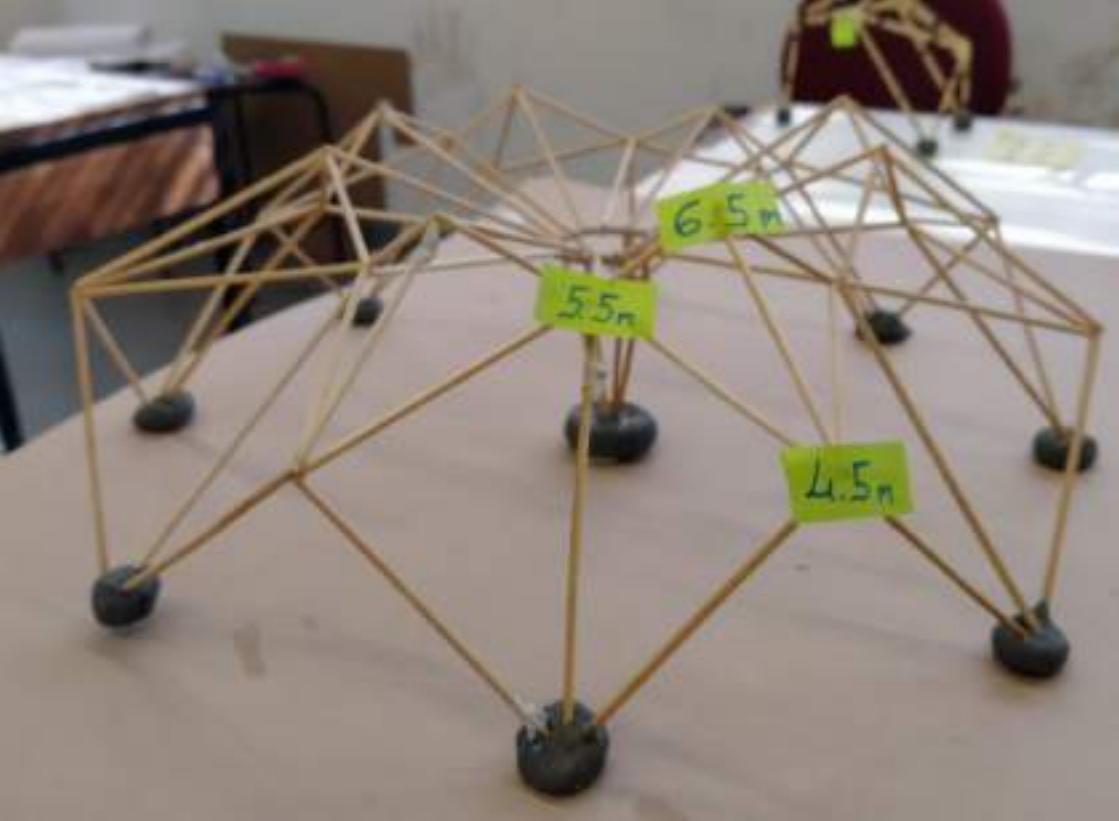
The Summer Winter School (SWS) programs differ from the regular semesters in terms of structure, approach and content. The key words that capture the spirit of SWS are experiment, variety and innovation. They explore emerging areas, provide space to test new ideas and methods, facilitate in-situ experience, help understand critical sites and situations, and create opportunities to learn by making. The courses in SWS are intense and are for short durations of between two to four weeks. Following is an indicative list of courses opted by our students:

Indicative list of elective courses opted by students:

- Programming with Excel and R studio
- Accounting and Financial Management Basics
- Mechanical Electrical Plumbing Fire- Fighting Service (MEPF)
- Building Services: Ensuring Comfort, Efficiency and Safety in Facilities
- Design of Ultra high-rise Building

Elective Courses offered

- Pre-stressed Concrete
- Design of Timber Structures
- Shell Structures
- Finite Element Methods
- Introduction to Parametric modeling tools in Structural Analysis and Design
- Design and Construction Aspects of Composite Structures
- Repair and Restoration of Historic Structures
- Skyscrapers – Evolution and Structural Concepts



Learning Environment & Campus Life

The atmosphere on CEPT campus is lively and conducive to free thinking. Interdisciplinary learning is encouraged and students get to collaborate with other built-environment professionals within the ecosystem of CEPT University. The University often invites some of the brightest minds from around the world to speak to students on cutting-edge developments in construction, architecture, planning, design, urban habitat development, and other global issues.

The state-of-the-art library has a wide variety of books, foreign journals, and other resources available to all students making CEPT University one of the best for built-environment resources in the country. Students have access to labs that facilitates various testing and mapping related to Engineering Materials, Fluid Mechanics, Geotechnical Engineering, Concrete Technology, Non Destructive Testing, Surveying and Leveling, Remote Sensing, GIS and Building Energy Efficiency, and Environmental Studies. The labs also provide earthquake shake table to assess seismic performances of students' designs. The FT-BIM Advancement Lab, in collaboration with Bentley BIM Institute, houses more than 50 licensed softwares including STAAD connect edition (whole Bentley package), CSI-ETABS and SAP, AutoCAD and Microsoft Office.

There are in-house IT support, premium printing and stationery facilities, student service office, university press and other services are some additional facilities that enhance the learning environment at the university.



Student Activities

CEPT University boasts of a multifaceted culture on and off-campus, reinforcing its image as an institute that inculcates all-round development of its students. The diverse community comes together to celebrate traditional and regional festivals on-campus throughout the year. Sports competitions such as the Amity Cricket Cup, Volleyball Tournament, Box Cricket League, and others fosters a positive environment, giving ample opportunities to participate.

At the Faculty of Technology, Student Chapters organize online and on-campus events for students to meet and learn from industry professionals and engage with peers. The FT newsletter is published by the student body quarterly, highlighting student/ faculty activities and achievements, important events, alumni interactions, placement and internship details, and insights on industry. Our strong alumni network gives students a chance to get in touch with them about future career prospects through the Student- Alumni Interaction platform.

Our students also actively participate in national scholarship programs, conferences, and technical competitions. The Faculty of Technology also collaborates with premier institutes such as ESRI and celebrates Engineer's Day, GIS day, and Remote Sensing day with active students participation. During Engineer's Day each year, students work around a topic to create awareness through role-play activities, lecture from eminent personalities, quiz contests etc.



Student's Chapters

Student's Chapters are formed with various objectives, some subject-specific, but broadly these chapters shall bridge the gap between standard academic courses and the current industrial practices. Students learn to work in groups, organize events, the opportunity to interact with industry experts, and participate in events and competitions.

They facilitate:

1. Better connection with associations and their activities.
2. Can participate in online webinar series, e-courses, expert lectures, and other programs offered by such organizations.
3. Students get the opportunity to volunteer for association events, thereby enhancing their organizational skills.
4. Opportunities for interaction with professionals for a future career path, recent trends, research, etc.
5. Association helps to promote events within their group resulting in better participation.
6. Institute gets resource persons for their academic programs and juries.

Below are the student chapters initiated by The Faculty of Technology :

1. IAStructure - Indian Association of Structural Engineering -Established in 2019
2. ICI - Indian Concrete Institute -Established in December 2018
3. IPA - Indian Plumbing Association -Established in November 2021
4. IEEE GRSS - Geoscience and Remote Sensing Society -Established in October 2022
5. ICACI - India Chapter of American Concrete Institute -Established in December 2022

Collaborations

The Faculty of Technology (FT) is keen to develop collaborations with renowned industries under the umbrella of MOU and EOI on a willingness to undertake activities related to research and development in the construction sector. The 3 major domains of collaborations are within the industry (DRP, placements, and/or Internships), international universities for exchange programs, and students' chapters with professional associations.

The following are the updates till date-for the year-2021-2022 :

1. Industry MOUs:

- Artocrete Possible Collaborative Initiatives: Lecture series on concrete, DRP related to concrete, Competition on concrete, Material support, Internship and Placements at FT for Bachelor's in Civil Engineering (Honours) program.
- Vconstruct Private Ltd.Pune based Construction Company Supports DRP,Internship and Placements at FT. Vconstruct also supports as well as Sponsored DRPs for Master's in Construction Engineering and Management (MCEM) and Bachelor's in Civil Engineering (Honours) programs.
- Visilean Cloudbased Solution Providers Placement support as well as sponsored DRPs for Master's in Construction Engineering and Management (MCEM) and Bachelor's in Civil Engineering (Honours) programs.
- DigiQc digitizing construction Placement/Internship support as well as Sponsored DRPs for Master's in Construction Engineering and Management (MCEM) program.
- Association of Geospatial Industries (AGI) supports DRPs, Internships, and Placements for students at FT Master's in Geomatics (MGEO).
- Shivalik Group of Companies supports DRPs, Internships, and Placements at Master's in Construction Engineering and Management (MCEM) and Bachelor's in Civil Engineering (Honours) programs.
- NeoGeo Technologies Private Ltd. supports DRPs, Internships, and Placements at FT Master's in Geomatics (MGEO).

2. FT International Universities - Exchange Programs

- University of Melbourne - Australia
- Polis University - Albania
- HFT Stuttgart University - Germany
- Instituto Politécnico de Castelo Branco (IPCB) - Portugal
- Polimi University - Italy

3. Industry sponsorships for students and Studios

- ET-TMT- "Build it Right" MOU to sponsor Annual Lecture Series on Engineer's Day Event 15th September for the period of 5 years till 2023.
- CEPT-PSP Scholarships

Program Tutors



Aanal Shah
Ph.D. (Core Faculty)



Dhara Shah
Ph.D. (Core Faculty)



Hiten Shah
(Visiting Faculty)



Kanisha Vora
(Visiting Faculty)



Rakesh Shah
(Visiting Faculty)



Mihir Vora
(Visiting Faculty)



Rupal Shah
(Visiting Faculty)



Mehul Shah
(Visiting Faculty)



Devang Patel
(Visiting Faculty)



Bhairav Patel
Visiting faculty



Shashin Patel
(Visiting Faculty)



Ashish Shah
(Visiting Faculty)



Krunal Mehta
(Visiting Faculty)



Meet Shah
(Visiting Faculty)



Keyur Patel
(Visiting Faculty)



Akhila Mutha
(Visiting Faculty)



**Roshan
Prajapati**
(Visiting Faculty)



Minoli Shah
(Visiting Faculty)



**Aashlesh
Gandhi**
(Visiting Faculty)



Sushant Goel
(Visiting Faculty)

Career Opportunities

Graduates of the MSED program are doing impactful work and building their careers in government organizations, corporate houses, academic and research institutes and as entrepreneurs and tech start-up founders in the urban sector.



Alumni Testimonials



Pratik Khatri

Practicing Consultant (Self-employed)

"CEPT proved to be pool of opportunities for me. The MSED curriculum was structured in such a way that it enabled me to set a strong foundation and build further. We learnt solving real life problems encountered by professionals. It was an amalgamation of core academics and practice that made my transition from campus to industry smooth. Apart from the variety and abundant knowledge I got from my regular classes, I got many opportunities to meet people from diverse and interdisciplinary backgrounds in electives and SWS courses. I am forever grateful for the visiting and core faculty for sharing abundant knowledge and expertise. CEPT was whole lot of fun and learning that sure trained me for life!"



Sohan Banga

ATKINS

"Pursuing my post-graduation at CEPT has been life altering for me. Not just the curriculum but the ambiance, interaction and above all the culture at CEPT is very inspiring and motivates to be inquisitive and perform better. I found the course curriculum to be very challenging but rewarding. MSED provided an ideal blend of practical structural design aspects with the basics of engineering. Rather than feeling lost, I was able to understand the work at ATKINS right away. It has been a perfect amalgamation of amazing colleagues and faculty, a thoughtful academic structure and progressive culture."



Jibeesh Rajan

AECOM

" My experience of MSED at CEPT University has been fantastic in many ways. The course content is very rigorous, yet flexible. The program started with a strong emphasis on basics of structural engineering and then taking it to advance design. The courses were handled by a mix of in-house faculty and external faculty who are pioneers in their respective domain like design of water tanks, silos, chimneys, industrial and marine structures respectively. The unique feature of the program is learning through design studios which give an opportunity to work independently on real problems and are guided by faculty teams. It was also exciting to be on one of the best designed campus in India."



Drishti Agrawal

VMS Consultants

"The comprehensive curriculum of the MSED program is an amalgamation of theoretical and practical knowledge. The studio pedagogy and the inputs from practicing structural engineers are designed to boost our confidence and prepare us to take professional responsibilities. The course helped me develop strong basics by introducing the finer and minute details of structural engineering and hence carving the way to a brighter future."

Student Testimonials

Divyankshi Jadav | MSED (2020-2022)

"Studying in the MSED program comes with a package of exploring and understanding concepts, implementing the same in the projects assigned and working hard for constant improvement. The studio-based learning and the guidance of industrial professionals help us become industry ready. The curriculum includes a variety of structures that helps us develop the approach for any project."

Chandan K | MSED (2020-2022)

"MSED program has helped me understand concepts of structural design deeply. The studio program and courses have been structured to bridge the gap between academics, research and professional world. Being a part of some interesting SWS courses, has also widened my thinking skills. Overall I believe the program has equipped me with the skills and prepared me for the diverse challenges that I will face in the professional world."

Julia Caroline | MSED (2020-2022)

"With everything happening in the world where everyone is forced to adapt to the new norms, studying in CEPT definitely exceeded my expectations on what to expect during my post graduate experience let alone during a pandemic. The curriculum is structured in such a way it challenges us to think in an unconventional manner and come up with real time solutions to problems faced in the design field. Meeting my classmates from diverse backgrounds and listening to expert lectures from professionals was a great learning experience."

Preksha Thacker | MSED (2020-2022)

"The MSED program at CEPT has groomed me professionally. The studio learning process encompasses a variety of projects that must be completed by students both in groups and individually, strengthening not just our domain knowledge but also helping us build soft skills like communication and team work. The two years give you an overview of how professional projects are dealt with and designed and the learning process is never-ending. The faculties have helped me think critically and have shown how structural designers can be unique in their own way."





Admission Procedure

How to apply?

The entire application process will be held online.

Visit www.admissions.cept.ac.in to know more.

Minimum qualification and eligibility criteria

1. National Applicants

- Applicants for the M.Tech. program in the general category shall have a minimum of 55% aggregate marks, and those in the reserved categories shall have a minimum of 50% aggregate marks in qualifying degree (or equivalent) from a recognized University / Institution. Applicant shall have cleared XII Examination in the science stream.
- BE/ B.Tech or equivalent in Civil Engineering, Construction Technology and Architecture and Urban Design (Architecture and Urban Design- minimum 5 years) from a recognized University/ Institution

2. International/Foreign Applicants

- BE/ B.Tech or equivalent in Civil Engineering, Construction Technology and Architecture and Urban Design (Architecture and Urban Design- minimum 5 years) from a recognized University/ Institution, with a minimum of 55% aggregate marks

3. Sponsored Candidates

A. General Eligibility

- Applicants for the master's program in the general category shall have a minimum of 55% aggregate marks, and those in the reserved categories shall have a minimum of 50% aggregate marks in qualifying degree (or equivalent) from a recognized University / Institution. Applicant shall have cleared XII Examination in the science stream.
- Applicants should have minimum 5 years of overall experience as on the last date of application of the year in which the application is made, with at least 2 years in service of the organization sponsoring his study. This organization can be academic, industrial, or research-based in the relevant field for which the candidate is seeking admission.

B. Program-Specific Qualifying degrees

- BE/ B.Tech or equivalent in Civil Engineering, Construction Technology and Architecture, and Urban Design (Architecture and Urban Design- minimum 5 years) from a recognized University/ Institution.

Contact details

Dr. Aanal Shah | Program Chair MSED, Acting Dean FT

Email: aanal.shah@cept.ac.in

Ms. Disha Shah | Admin

Email: disha.shah@cept.ac.in

Contact Number: +91-79-68310000 Ext. 332



@Faculty of Technology CEPT University



@Faculty of Technology, CEPT University (FT-PG)



@ftpg_cept



@msed_ft_cept



CEPT admissions office

Email: admissions@cept.ac.in

Contact Number : +91 79 68310000,

+91 79 26302430

Toll free number: 1800-270-4030

CEPT University

K.L. Campus, University Road,

Navrangpura, Ahmedabad - 380009

Gujarat, India

Visit: www.cept.ac.in