Concrete and Advanced Concrete Technology Laboratory

Dr. Sri Kalyana Rama Jyosyula
Concrete and Advanced Concrete Lab Incharge

Concrete Technology Laboratory at Mahindra University aims to develop sustainable and economical solutions to meet the needs of the industry. The laboratory is well equipped to train students to conduct various experiments to understand the physical, chemical and mechanical properties of construction materials and durability characteristics.

The services offered by the laboratory are:

- Academic: Train undergraduate students as a part of their curriculum, Undergraduate and Postgraduate project works.
- Research: Investigate the properties of sustainable and futuristic materials, development of economical and eco-friendly concreting solutions.
- Consultancy: Construction material testing and mix design of concrete, Durability studies on concrete, and NDT of concrete.

On-going research projects:

- High performance precast concrete composites
- 3D printed concrete for non-structural applications
- Durability of Alkali-activated and geopolymer concrete
- Bond properties of Fiber reinforced concrete
- Ultra-high performance concrete for structural and non-structural applications
- Development of concrete products with mining waste and natural admixtures

Research expertise available with the laboratory:

- Prof. Ganesh Babu Kodeboyina (Prof. Ganesh Babu Kodeboyina | Mahindra University)
- Prof. Visalakshi Talakokula (Prof. Visalakshi Talakokula | Mahindra University)
- Dr. Mohd. Ataullah Khan (Dr. Mohd. Ataullah Khan| Mahindra University)
- Dr. Sri Kalyana Rama Jyosyula (Dr. Sri Kalyana Rama Jyosyula| Mahindra University)

Some of the recent undergraduate project works performed in the laboratory:

- Effect of Nano-silica on the performance of Sustainable concretes
- Adaptability of 3D Printed Concrete for Non Structural Applications
- Determination of Mechanical Properties of Unreinforced Masonry Specimens
- Fiber reinforced concrete for enhanced energy absorption
- Geopolymer concrete from waste materials

Equipment available in the laboratory:

The laboratory is well equipped with all the necessary instruments to test the basic material properties and advanced facilities are also available for M. Tech and Ph. D students.

Facilities available for **Undergraduate Students** at Concrete Technology Lab is given below

S. No	Equipment
1.	Universal Testing Machine
2.	Compression Testing machines
3.	Brazilian Test Apparatus
4.	Blaine's Air Permeability Apparatus
5.	Cement tensile testing
6.	Vicat's Apparatus
7.	Flow Table
8.	Vibrating Table
9.	Needle Vibrator
10.	Concrete Mixer-Drum
11.	Concrete Mixer 50 cubes Capacity
12.	Accelerated curing tank
13.	Compression Testing Machine with 200 Ton capacity
14.	Universal Testing Machine with 100 Ton capacity

Facilities available for **M. Tech and Ph. D Students** at Advanced Concrete Technology Lab is given below

S. No	Equipment
1.	Vane Shear Test Apparatus
2.	Viscocity Test Apparatus
3.	Energy Absorption Test on Concrete
4.	Abrasion Resistance of Concrete
5.	Rapid Chloride Permeability Teat Apparatus
6.	Oxygen Permeability Indicator
7.	Water Penetration Apparatus
8.	Shrinkage Apparatus
9.	Half Cell Potentiometer
10.	Concrete Resistivity Meter
11.	Corrosion Rate Meter
12.	Coating Thickness Gauge
13.	PIT Depth Gauge
14.	Mist Generation Unit
15.	Cement Autoclave Apparatus
16.	Pan Mixer for Concrete

17.	Carbonation Chamber
18.	Humidity Chamber
19.	Muffle Furnace upto 1600^0C
20.	Self-Compacting Concrete Apparatus – Flow Table, V Funnel, L Box, U Box, J Ring
21.	Anton Paar Dynamic Shear Rheometer
22.	3D Printer for Concrete
23.	Controls Universal Testing Machine for Fracture, fatigue, and flexure
24.	Brick Making Machine
25.	250 KG capacity Pan mixer for HPC, UHPC, and 3D printed concrete
26.	Non Destructive Testing-Pundit Lab Ultrasonic Pulse Velocity and Rebound Hammer Test, Profometer, Rebar Locator

Images of Advanced Facilities in the Lab

Figure 1 3D Printer and 3D printed Concrete elements

Figure 2 Dynamic Shear Rheometer

Figure 3 Carbonation Chamber

Figure 4 Brick Making Machine

Figure 5 Controls Testing Machine

Figure 6 Compression and Universal Testing Machine

Figure 7 Humidity Chamber, Mortar Mixer, Vibration Table, Permeability, Shotcrete Impact, Muffle Furnace, Mist Generating Unit

Research Scholars in Concrete Technology Laboratory:

S.no	Name and Photograph	Area of Research
1	**Lakshmi Thotakura** 	• High Strength and Ultra-High Strength Concretes • Sustainable Materials
2	**Venugopal Mandala** 	• Fiber reinforced concrete • Bond properties of concrete with fibers

3	**Kailash Kumar Singaram** 	• Geopolymer Concrete • 3D Printing
	Sandeep Devarashetty 	• Alkali Activated Concrete • Carbonation of AAC
	Ramesh Gomasa 	• Structural Health Monitoring • Fracture of concrete
	Yeturi Pramod Kumar Reddy 	• Precast Concrete wall Panels • High Performance and Light Weight concrete
	Prakki Jaya Raghu Lakshmi Pavani Susmitha 	• Ultra-High-Performance Concrete • Rheology of SCMs

	Mangalampalli Anil Kumar 	• 3D printed concrete • Rheology of SCMs
	Sangita De 	• 3D printed concrete • Machine Learning