# HOPE 25 Concrete Mix & Cube Design

**Demonstrate your structural engineering skills**

### Objective:

The Concrete Mix & Cube Design competition at HOPE 25 is a hands-on challenge for civil engineering enthusiasts to showcase their expertise in concrete technology and structural design. Teams will attend an introductory seminar, design a concrete mix, cast a cube specimen, and test its strength the following day. From calculating the perfect mix ratio to achieving optimal compressive strength, this event tests both theoretical knowledge and practical skills.

### Event Details:

Team Competition (Maximum 4 members per team)

### Prizes:

1st Place: ₹1000 | 2nd Place: ₹1500

## Event Structure

### Seminar:

- A pre-competition seminar will be conducted to cover the fundamentals of concrete mix design, material properties, and testing procedures.
- Attendance is mandatory for all participants.
- Duration: Approximately **2 hours**. (10 AM - 12 PM)

### Competition Day 1: Mix Design & Cube Casting

- Teams will design a concrete mix by calculating the ratio of cement, sand, and metal (coarse aggregate) based on seminar teachings.
- Materials will be provided by the organizers (cement, sand, metal, water, and moulds).
- Teams will prepare their mix and cast it into a cube mould of size 15x15x15 cm.
- Maximum duration for mix design and casting: 1 hour.

### Competition Day 2: Cube Testing

- After curing overnight (approximately 24 hours), the moulds will be opened.
- The compressive strength of each cube will be tested using a compression testing machine in the Civil Lab.
- Testing will be supervised by judges and lab staff.

# Rules and Guidelines:

## Team Registration:

- Teams must register online at **hope.gptcperinthalmanna**.in by **March 5, 2025**.
- Open to all civil engineering students of the college hosting HOPE 25.
- Teams can have a maximum of 4 members. Solo participation is not allowed.

## Materials & Equipment:

- All materials (cement, sand, metal, water) and cube moulds (15x15x15 cm) will be provided by the organizers.
- Use of personal materials or tools is not permitted unless approved by the coordinators.

## Mix Design:

- Teams must calculate their own mix ratio (cement:sand:metal) based on seminar guidelines.
- Water-cement ratio and workability should be considered in the design.
- Calculations must be submitted on paper along with the cast cube.

## Casting:

- Concrete must be mixed manually or with provided equipment within the 1-hour time limit.
- The cube mould must be filled completely, compacted properly, and leveled off.
- Any cube with visible defects (e.g., honeycombing) may be penalized.

## Curing & Testing:

- Cubes will be labeled and stored for curing by the organizers overnight.
- Testing will occur the next day under controlled conditions using a standard compression testing machine.
- Teams are encouraged to attend the testing session to observe results.

## Judging Criteria:

- **Mix Design**: Accuracy and rationale of the calculated mix ratio.
- **Compressive Strength**: Measured strength of the cube in $N/mm^2$.
- **Workmanship**: Quality of casting (e.g., uniformity, compaction).
- **Documentation**: Clarity and completeness of submitted calculations.

## General Rules:

- All team members **must attend the seminar** to participate in the competition.
- No external assistance or pre-made mix designs are allowed.
- Time limit of 1 hour for Day 1 activities (mix design and casting) will be strictly enforced.
- The decision of the judges and organizers is **final**.

## Contact:

For clarifications, reach out to the following before the event.

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