CIVILIZATION
SEASON 2
where everything begins

RULEBOOK

MIX MASTER

ORGANIZED BY:
ASCE STUDENT CHAPTER, DUET

IN COLLABORATION WITH:
DEPARTMENT OF CIVIL ENGINEERING, DUET

The "**Mix Master"** is a High Strength Concrete Cylinder Challenge which is a hands-on technical event designed to assess participants' understanding of concrete technology, mix proportioning, and material performance. Participants will design and prepare concrete cylinders aiming to achieve the **maximum compressive strength** while maintaining economy, accuracy, and quality workmanship.

OBJECTIVE:

- To encourage practical application of concrete mix design principles, teamwork, and technical decision-making among future civil engineers.

ELIGIBILITY:

- Each team shall consist of maximum 3 members.
- Each team has to involve a faculty advisor as their supervisor.
- Participants must be undergraduate students of Civil Engineering or relevant discipline from any recognized university.
- Teams must register by the announced deadline via the official CEvilization registration portal or Google Form.
- Each university may send multiple teams, provided they are registered separately.
- A faculty advisor may supervise multiple teams.
- Team names should be unique and professional.

MATERIALS:

- Cement: Ordinary Portland Cement (OPC) or Portland Composite Cement (PCC) (as available).
- Aggregates: Crushed stone (coarse) and natural sand (fine).
- Admixtures: Any kind of strength-enhancing additive or chemical admixture is allowed.
- Water: Potable water meeting BNBC/ASTM standards.

Additional Materials:

- Any material that may enhance the strength of concrete can be used only with proper documentation and prior declaration.
- Polymer fiber and steel fiber may be used as concrete ingredients.
- The cylinder specimen must be plain concrete only. Reinforced concrete is strictly prohibited.

RULES AND REGULATIONS FOR THE Mix Master:

❖ Casting Procedure

- Each team must cast their concrete cylinders at their respective university campus under the supervision of a faculty advisor.
- The casting process must be properly documented with photos and short clips as evidence of authenticity.
- Each team shall prepare a set (3 cylinders) of standard cylinders (100 mm × 200 mm) for testing.
- All specimens must be cured for 28 days (±2 days) before testing.
- Cylinders older than 30 days at the time of testing will incur a penalty deduction from the final score.
- Any visible defect, honeycombing, or non-standard finishing may lead to disqualification or score reduction.

❖ Mix Design and Documentation

- Teams must submit a detailed mix design sheet within 10 days of casting. The sheet should include:
  - Material proportions (cement, sand, aggregate, water, admixtures)
  - Target strength and theoretical calculations
  - Predicted compressive strength (f'c)
  - Material cost breakdown and total mix cost per m^3
- A cost-performance ratio may be considered during evaluation to encourage economical design.
- The submitted mix design & other documentation must be signed by the team leader and faculty advisor.

❖ Curing and Storage

- Cylinders must be cured using standard water curing methods (submerged or moist curing) at normal temperature.
- Teams must ensure the specimens are properly labeled with team name/code and casting date.
- Improper curing or labeling will result in score penalties.
- Cylinders must remain in good condition until testing day. Cracked or damaged specimens will not be tested.

❖ Testing

- Testing will be conducted during the competition day using a Universal Testing Machine (UTM) at DUET campus under the supervision of the Technical Committee.
- Each cylinder's dimensions (diameter and height) will be measured before testing to ensure accuracy in strength calculation.
- The ends of each cylinder must be properly polished before submission to ensure uniform load distribution during compression.
- Each team's average compressive strength will be calculated from their tested specimens.
- Teams must be present during the testing session; absence may result in disqualification.
- Teams must bring hard copy of their submitted reports and faculty advisor's certification of authenticity.
- The judges' decisions will be final and binding.

❖ Evaluation (Total = 100 Marks)

The total score is derived from the following categories, calculated using the specific formulae below.

Category	Formula / Method	Marks	Notation
Compressive Strength	$S_{Str} = 55 \times \left(\frac{f_{avg}}{f_{max}}\right)$	**55**	f_1, f_2, f_3 = Compressive strength of three cylinders (MPa) f_{avg} = Average strength, $f_{avg} = \frac{f_1 + f_2 + f_3}{3}$
	• f_{max} = Highest average strength among all participating teams		
Economy	**Score ($S_{economy}$):** $S_{eco} = 15 \times \left(\frac{P}{P_{max}}\right)$	**15**	**C** = Cost per m³ P = Strength-cost performance $P = \frac{f_{avg}}{C}$
	• P_{max} = Highest strength-cost performance among all teams		
Strength–Density Efficiency	**Efficiency (E):** $E = \frac{f_{avg}}{\rho_{avg}}$ **Score ($S_{density}$):** $S_{den} = 10 \times \left(\frac{E}{E_{max}}\right)$	**10**	ρ_i = Density of cylinder i: $\rho_i = \frac{\text{Mass of cylinder i } (m_i)}{\text{Volume of cylinder i } (V_i)}$ ρ_{avg} = Average density $\rho_{avg} = \frac{\rho_1 + \rho_2 + \rho_3}{3}$
	• E_{max} = Highest Strength-Density Efficiency among all teams		
Cylinder Uniformity	**Variation Ratio (V):** $V = \frac{f_{\max(cyl)} - f_{\min(cyl)}}{f_{avg}}$ **Score ($S_{uniformity}$):** $S_{uni} = 5 \times \left(\frac{V_{min}}{V}\right)$	**5**	$f_{\max(cyl)}$ = Max^m strength among three cylinder $f_{\min(cyl)}$ = Min^m strength among three cylinder
	• V_{min} = Lowest variation ratio among all teams		

Documentation & Viva	Submitted report evaluation	**15**	Your report should include mix-design, casting verification, costing calculation etc.
	Technical evaluation		You must explain *why* you made your engineering decisions (e.g., selection of W/C ratio, admixture type)

Final Score Calculation

The final ranking is determined by the summation of scores from all categories:

$$\boldsymbol{Total\ Score} = S_{str} + S_{eco} + S_{den} + S_{uni} + S_{doc} + S_{viva} - Penalty$$

❖ **IMPORTANT DATES:**

Topic	Date	Medium/Venue
Registration Starts	20 November 2025	Online
Workshop on Mix Master	28 November 2025	Online
Registration Closed	08 December 2025	Online
Casting of Specimen	10-12 December 2025	On Campus
Mix design and costing report submission*	22 December 2025	Online
Video Submission	20 December 2025	Online
Specimen test	10 January 2026	DUET Campus

*All submission must be approved by faculty advisor

🏆 **Prize pool:**

- Prizes will be awarded to Champion, 1st Runner-up & 2nd Runner-up based on their attained scores.
- An alluring prize pool of 50k+ has been announced that will be distributed among the winners.
- Besides a Gorgeous Crest and winning Certificate will be offered to the winners of this Mix Master segment.

🎁 Registered Participants will receive →

- Event Kits [T-Shirt + Merchandise + ID Card]
- Breakfast and Lunch
- Participation Certificate
- Transport Facilities (Specific Routes)

Note: *The rules and guidelines outlined above are subject to change at the discretion of the organizing committee. Participants are advised to check for updates and announcements regarding the competition regularly*

Registration Fee: BDT 1800/- per team

❖ **For Further Queries**

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For More Updates

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