INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

CONSORTIUM – 2025

A National Level Students Technical Fest (31 October - 1 November, 2025)

AquaStruct – The Concrete Canoe Challenge

Rules and regulations:

1. Team Composition

- Maximum **5 members per team**.
- All members must be enrolled students of the participating college.
- Teams must designate a **Team Leader** responsible for communication with organizers.
- Registration fee: ₹ 300 / Team

2. Canoe Specifications

Parameter	Guideline
Maximum Length	1 meter
Width	Suggested ≤ 0.4–0.5 meters for stability
Height / Depth	Suggested ≤ 0.3 meters
Maximum Weight	Approx. 15–20 kg for a 1-meter canoe (adjust proportionally for smaller canoes)
Material Restrictions	Any type of reinforcement (fibers, meshes, rods, polymer additives) allowed
Additives	Polymer, silica fume, fly ash, superplasticizers permitted for better workability, strength, and buoyancy

Note: Canoes must be **self-supporting** and able to float without additional buoyancy aids.

3. Materials & Construction

Teams can use:

- **Concrete:** Portland cement-based or blended cement.
- **Aggregates:** Fine aggregates only (for smoother surface and lighter weight).
- **Reinforcements:** Fibers (steel, polymer, glass), meshes, rods, or combinations.
- **Additives:**
    - Superplasticizers for flowable concrete

- Silica fume or fly ash for higher strength and reduced permeability
- Polymers (latex, epoxy) for improved toughness and water resistance

4. Design Guidelines

- Canoes should be **structurally stable** and **buoyant**.
- Open to **creative shapes and aesthetics**, but must not exceed max length and weight.
- Surface finish and detailing will be part of evaluation.
- Lightweight, hollow structures are encouraged for better buoyancy.

5. Submission & Inspection

- Teams must submit:
  1. **Canoe design sketches** with dimensions.
  2. **Material list** including cement type, aggregates, additives, reinforcement used.
  3. **Construction method** (molding, layering, curing).
- **Inspection:**
  - Canoes will be checked for weight, dimensions, and structural integrity.
  - Buoyancy test in water before presentation is mandatory.

6. Evaluation Criteria

Category	**Marks**	**Details**
Design & Creativity	40	Innovation, shape, aesthetic appeal
Material Innovation	20	Use of special additives, lightweight solutions
Surface Finish & Detailing	20	Smoothness, painting, artistic touches
Structural Integrity & Buoyancy	20	Floats well, no cracks/leaks under weight
Total	100	

7. Safety Guidelines

- Canoes must be stable to prevent tipping during demonstration.
- Participants should wear gloves while handling unfinished concrete surfaces.
- Sharp edges must be rounded to prevent injury.

8. Description

The **"AquaStruct" Concrete Canoe Challenge** is an event where student teams, typically those studying civil engineering, design, construct, and race a canoe made entirely out of concrete.

The challenge focuses on applying engineering principles, project management, and material science to create a water-worthy vessel from a material traditionally known for sinking. Teams are judged on a technical design, an oral presentation, and the final product's aesthetics and craftsmanship.

The core difficulty lies in developing a unique, lightweight, yet durable concrete mix design that allows the canoe to float and withstand the stresses of racing. The event showcases innovation in concrete technology and provides valuable, hands-on experience for future civil engineers.

10. Student Coordinators

S.No.	Name	Mobile number
1	Vishwanath Abhinay Teja	6301308945
2	Mohammad Ayaz Ahmad	7801017638

11. Faculty coordinators

Mr. K. Anand Goud, Assistant Professor, Department of Civil Engineering

Mr. R. Suresh Kumar, Assistant Professor, Department of Civil Engineering

Themes for Paper Presentation

Department of Civil Engineering **-** *Technical seminar topics*

1. Sustainable and Green Construction

2. Smart Cities and Digital Technologies in Civil Engineering

3. Transportation and Infrastructure Development

4. Water Resources and Environmental Engineering Solutions

5. Artificial Intelligence and Machine Learning in Civil Engineering