



ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY
(ESTD, UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
Rajampet, Annamayya District, A.P – 516126, INDIA



ACTIVITY REPORT

REPORT ON THE VISIT OF SERC Chennai

Date of Visit: 26th September 2024

Location: Structural Engineering Research Centre (SERC), CSIR Campus, Taramani, Chennai, Tamil Nadu

Faculty Coordinators: Dr N R Gowthami and Mr. B Raghunatha Reddy

1. Introduction

An industrial visit was organized for the students to the **Structural Engineering Research Centre (SERC)** in Chennai, a premier national laboratory under the **Council of Scientific and Industrial Research (CSIR)**. The primary aim of the visit was to provide students with hands-on exposure to the latest research practices, testing facilities, and innovations in the field of structural engineering, thereby supplementing theoretical classroom learning with practical, real-world applications.

SERC plays a pivotal role in research, design, and consultancy services related to structural engineering, earthquake engineering, wind engineering, computational mechanics, and the development of special-purpose structures for industrial, transportation, and defense applications.

2. Objectives of the Visit

- To familiarize students with large-scale experimental setups and testing methodologies in structural engineering.
- To gain insights into research and consultancy services offered by SERC to industries and government agencies.



- To understand the integration of theoretical engineering principles with experimental validation.



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- To explore career and research opportunities in the domain of advanced structural engineering.

3. Overview of SERC Facilities Visited

a) Structural Testing Laboratory

Students observed full-scale and scaled-down models being tested for strength, deformation, and failure characteristics. The facility houses **servo-controlled hydraulic actuators, reaction frames, and load cells** capable of simulating complex loading conditions.

b) Fatigue and Fracture Laboratory

This lab demonstrated testing procedures to evaluate the **fatigue life** of components and study fracture mechanics. Students learned how repeated cyclic loading affects material performance and how data is collected for structural health assessment.

c) Earthquake Engineering Laboratory

The visit to this section highlighted **shake table testing** — a simulation of seismic effects on buildings and bridges. This gave students a practical understanding of how earthquake forces influence structural behavior and design considerations for seismic zones.

d) Wind Engineering Laboratory

Here, students saw the **boundary layer wind tunnel**, where scale models of structures are tested under simulated wind conditions. Demonstrations illustrated the effects of wind-induced vibrations, flutter, and aerodynamic stability.

e) Advanced Materials Research Division

The team was shown the development and testing of **fiber-reinforced composites, high-performance concrete, and corrosion-resistant materials**, which are critical for long-lasting infrastructure.

4. Technical Demonstrations and Interactions

The visit included live demonstrations where students observed:

- Calibration and operation of **data acquisition systems** for recording structural responses.
- **Non-destructive testing (NDT) techniques** for evaluating structural integrity without causing damage.
- Examples of **structural retrofitting methods** for damaged components.
- Analysis of **load-displacement curves** and their importance in determining structural performance.

During the interaction session, students posed questions regarding:

- National and international design standards followed at SERC.
- Computational modeling and simulation before physical testing.
- The role of research in influencing **IS codes** and structural safety guidelines.



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5. Key Learnings

From this visit, students gained:

- An understanding of **real-scale testing** and its relevance in ensuring structural safety.
- Awareness of how experimental results are used to validate **finite element analysis (FEA)** and computational models.
- Knowledge about advanced materials and their role in modern construction.
- Appreciation for the **interdisciplinary nature** of structural engineering, involving mechanics, materials science, and computational modeling.

6. Benefits of the Visit

This industrial exposure helped students bridge the gap between academic curriculum and industry needs. The technical knowledge, combined with the opportunity to observe state-of-the-art testing equipment, will greatly benefit their future professional endeavors. The visit also sparked interest in pursuing **postgraduate research opportunities** and careers in specialized engineering fields.



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7. Conclusion

The visit to SERC Chennai was a **highly enriching and inspiring experience**. It not only strengthened students' technical knowledge but also expanded their awareness of ongoing advancements in structural engineering research. The practical exposure to large-scale testing, seismic simulation, and advanced material development will undoubtedly contribute to their academic growth and professional readiness.

B. Raghunatha Reddy
B. Raghunatha

Event Coordinators

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