DEPARTMENT OF MECHANICAL ENGINEERING

Industrial Visit Report

Organization: Bangalore Metro Rail Corporation Limited (BMRCL)

Date of Visit: 23/09/2025
Location: Arabic College Main Road, Venkateshapura, Bengaluru, Karnataka-560045
Department: Mechanical Engineering
Attendees: 5th Semester Students
Accompanied by: Dr. Nagabhushana N and Dr. Hemanth Raju T
Duration: 09:30 AM - 04:30 PM

1. Objective of the Visit

The Department of Mechanical Engineering organized an industrial visit to BMRCL with the objective of providing students hands-on exposure to large-scale urban transportation infrastructure. The visit offered valuable insights into the execution of metro rail projects, advanced construction methodologies, rolling stock maintenance, and the intricacies of signalling and control systems.

Students gained a deeper understanding of sustainable urban mobility practices and the engineering innovations driving modern metro systems. The experience served to bridge the gap between academic learning and real-world applications, highlighting contemporary challenges, safety protocols, and cutting-edge technologies employed in metro rail operations.

2. Company Overview

The **Bangalore Metro Rail Corporation Limited (BMRCL)** is the nodal agency responsible for the development, operation, and expansion of **Namma Metro**, Bengaluru's rapid transit system. Established in **1994** as a **Special Purpose Vehicle (SPV)**, BMRCL is a joint venture between the **Government of India** and the **Government of Karnataka**, aimed at delivering world-class urban mobility solutions. **Namma Metro** commenced its first commercial operations in **October 2011**, marking a significant milestone in the city's transportation landscape. Since then, the network has steadily expanded, with additional lines and phases currently under construction or in the planning stages.

Current Operational Highlights

- **Total Network Length:** Approximately **96.10 km**
- **Operational Stations: 83** (including elevated, underground, and at-grade stations)
- **Track Type: Standard Gauge**
- **Power Supply: 750V DC via third rail** in many sections.
- **Train Speed:** Designed for speeds up to **80 km/h**, with actual operating speeds adjusted based on section and safety protocols.

BMRCL continues to play a pivotal role in transforming Bengaluru's urban transport ecosystem by integrating advanced engineering, sustainable practices, and commuter-centric innovations.

Key Areas of Focus

During the industrial visit to Bangalore Metro Rail Corporation Limited (BMRCL), students explored several core aspects of metro rail operations and infrastructure. The visit began with an overview of metro infrastructure and civil engineering works, including the design and construction of elevated and underground stations, tunneling techniques, and structural safety measures.

Students were introduced to rolling stock and maintenance facilities, where they learned about metro coach design, capacity, and depot activities such as inspection, repair, and preventive maintenance.

The session also covered signaling, communication, and control systems, highlighting automatic train control, train protection mechanisms, and real-time monitoring through the centralized Operations Control Centre (OCC).

In the area of power supply and traction systems, students gained insights into the 750V DC third-rail traction supply, substation design, electrification processes, and energy efficiency initiatives.

Safety and security practices were emphasized, including passenger safety protocols, emergency preparedness, evacuation drills, and the use of CCTV surveillance, access control, and fire safety systems.

The visit showcased sustainable and smart practices such as energy-efficient trains, rainwater harvesting, solar power integration, and the metro's role in reducing traffic congestion and carbon emissions. Finally, students were briefed on project management and expansion plans, covering ongoing and future phases of Namma Metro, challenges in urban mass-transit development, and funding mechanisms.

5. Student Feedback

The industrial visit to BMRCL provided students with valuable practical exposure to metro infrastructure, rolling stock systems, and advanced control technologies. They gained a deeper appreciation for how classroom concepts in mechanics, design, power systems, and project management are effectively applied in real-world metro operations.

The session on safety protocols and sustainability practices offered insights into how urban transport systems ensure passenger security while minimizing environmental impact through eco-friendly initiatives.

Students also benefited from direct interaction with BMRCL professionals, which helped them understand potential career paths in the transport and infrastructure sectors. Overall, the visit was highly informative, interactive, and motivating, significantly enhancing students' technical knowledge and broadening their awareness of modern urban mobility solutions.

6. Conclusion

The industrial visit to Bangalore Metro Rail Corporation Limited (BMRCL) offered students a comprehensive understanding of modern urban mass-transit systems and their engineering complexities. The exposure to metro infrastructure, rolling stock maintenance, signaling and traction systems, and sustainable practices helped bridge the gap between academic knowledge and industry applications.

Students gained valuable insights into project management, safety protocols, and future expansion strategies, which broadened their perspective on career opportunities in the transportation and infrastructure sectors. Overall, the visit was highly enriching, fostering technical learning, professional awareness, and motivation to apply engineering skills to real-world challenges.

ಬೆಂಗಳೂರು ಮೆಟ್ರೋ ರೈಲ್ ನಿಗಮ ನಿಯಮಿತ

Bangalore Metro Rail Corporation Ltd.

(A Joint Venture of Government of Karnataka & Government of India)

Regd. Office : B.M.T.C. Complex, 3rd Floor, K.H. Road, Shanthinagar, Bangalore - 560 027. INDIA

No: BMRCL/Advisor (PM)/Industrial Visit/Vol-2/2025-26 Date.20.09.2025

To,
Head of the Department,
Department of Mechanical Engineering,
New Horizon College of Engineering,
Ring Road, Bellandur Post,
Near Marathahalli, Bengaluru – 560 103.

Sir,

Sub: Permission for Visit Ongoing Metro Construction UG-RT04 Site.

*****

Adverting to your letter referred above, it is to inform that, Competent Authority has accorded permission for visit BMRCL underground RT-04 Tunnel Work on 23rd September 2025 from 11:00 A.M for 43 students and 2 Faculty Members, with following conditions.

1) Transportation to work site has to be made by College.
2) Responsibility of Safety to the students is to be taken care by College staff accompanying the students.
1) Instruction given by the Engineer shall be strictly adhered during the visit. One of the UG station area is safe for site visit and not tunnel with limited students at a time.
3) Students & Accompanying faculty shall be equipped with necessary PPE. (Personal Protective Equipment's)

Contact Person for the Site visit:

Mr. Shivashankar A G, Deputy Chief Engineer (UG-RT-014), BMRCL, Contact No: 9449509324.

Thanking You,

Yours faithfully,

(M. Srinivas)
Advisor (PM),

Copy to:

1. ED-I (Civil), BMRCL-for kind information and needful.
2. CE -(UG-2) -for kind information and needful.
3. Mr. Shivashankar A G, Deputy Chief Engineer (UG-RT-014), BMRCL -for kind information and needful.

BMRCL Approval Letter

NEW HORIZON
COLLEGE OF ENGINEERING

Department of Mechanical Engineering

Industrial Visit

23rd September 2025

10:00 AM to 3:00 PM

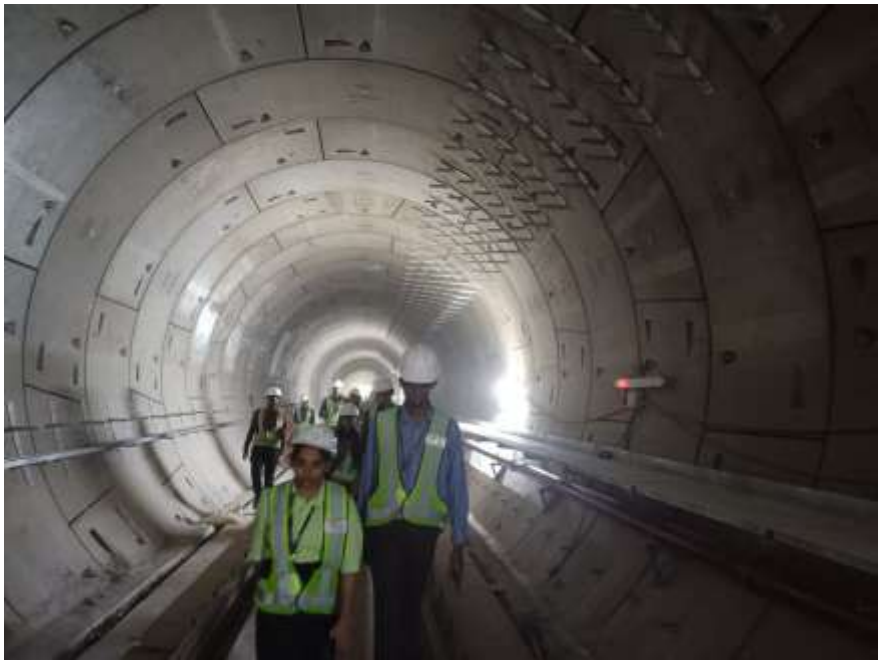
5th Semester Students

Bangalore Metro Rail Corporation Limited, Byappanahalli, Bengaluru, Karnataka-560038

Faculty Coordinator	Industrial Visit Coordinator	Convenor	
Dr. Sudarshan T A	**Dr. Nagabhushana N**	**Prof. Rakesh C**	**Dr. Manjunatha**
Senior Assistant Professor - ME	Senior Assistant Professor - ME	HoD - ME	Principal

Industrial Visit Poster


Bengaluru,Karnataka,India
1st Cross Road, Kadugondanahalli, Bengaluru,
Karnataka 560045, India
Lat 13.017850, Long 77.617253
09/23/2025 11:22 AM GMT+05:30
Note : Captured by GPS Map Camera




Bengaluru,Karnataka,India
Kushal Nagar, Kadugondanahalli, Bengaluru,
Karnataka 560045, India
Lat 13.017264, Long 77.618079
09/23/2025 11:39 AM GMT+05:30
Note : Captured by GPS Map Camera

Glimpse of the Industrial Visit