माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE

Department of Electronics & Telecommunication Engineering

Industrial Visit Report

Bharat Sanchar Nigam Limited (BSNL) Gwalior , M.P.

DATE- 30/08/2025

Acknowledgement

We express our sincere gratitude to **Bharat Sanchar Nigam Limited (BSNL), Gwalior Team** for granting us the opportunity to visit their premises and gain valuable insights into real-world telecommunication systems. We would like to thank our faculty members for organizing this visit, and the BSNL officials and engineers who patiently explained the concepts and demonstrated the working of various systems and equipment. This industrial visit has greatly enriched our learning experience.

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1. Introduction

As part of the Electronics and Telecommunication branch curriculum, an industrial visit to **Bharat Sanchar Nigam Limited (BSNL)** was organized. The visit aimed at exposing students to practical telecommunication systems and bridging the gap between theoretical concepts and real-time applications.

During the visit, we explored switching centers, transmission media, network technologies, and advanced machines used in telecom operations.

2. Objectives of the Visit

- To study the functioning of the **Mobile Switching Center (MSC)**.
- To understand the difference between **wired and wireless networks**.
- To learn about the evolution of mobile communication from **2G to 4G**.
- To observe the use of **optical fiber and copper wire** in data transmission.
- To gain knowledge about **BTS, routers, and nodes**.
- To observe advanced equipment like **MAAN machines** used for network monitoring.

3. Observations and Learning

3.1 Mobile Switching Center (MSC)

We observed that the MSC is the heart of the mobile communication system. It manages call routing, billing, and

handovers between towers, ensuring seamless connectivity across the network.

3.2 Wired and Wireless Networks

- **Wired:** Initially dependent on copper wire, but now being replaced by **optical fiber** for higher bandwidth, speed, and reliability.
- **Wireless:** Uses BTS, routers, and nodes to establish connectivity and provide mobile internet and telephony services.

3.3 Generations of Mobile Technology

- **2G:** Mainly voice communication and SMS.
- **3G:** Enhanced data services and video calling.
- **4G:** High-speed internet, multimedia streaming, and VoLTE

  We also had discussions on the upcoming **5G technology**.

3.4 Transmission Media: Optical Fiber and Copper Wire

- **Optical Fiber:** Provides high-speed data transfer with longer distance coverage and better reliability.
- **Copper Wire:** Traditional medium, still used but limited in capacity.

3.5 Base Transceiver Station (BTS)

The BTS connects user mobile phones to the network via radio waves. Each BTS covers a specific cell area and interacts with the MSC for call and data transmission.

3.6 Routers and Nodes

Routers manage data traffic and ensure efficient data flow. Nodes act as junction points for data distribution in both wired and wireless systems.

3.7 Machines (MAAN)

We observed **MAAN (Measuring and Analysis Network) machines**, which are used for network testing, monitoring, and performance analysis to ensure uninterrupted telecom services.

4. Learning Outcomes

- Gained a clear understanding of how switching and transmission work in real telecom networks.
- Learned about the advantages of optical fiber over copper.
- Understood the evolution of mobile technologies (2G → 3G → 4G).
- Observed BTS, routers, and nodes and their significance in wireless communication.
- Learned how BSNL engineers use MAAN machines to monitor and troubleshoot networks.
- Strengthened practical knowledge in line with classroom theories.

5. Conclusion

The industrial visit to **BSNL** proved to be an enriching and insightful experience. It provided us with practical knowledge of telecommunication systems and infrastructure, including

wired and wireless networks, switching centers, optical fiber, BTS, and network monitoring equipment. The visit effectively connected our academic learning in **Electronics and Telecommunications** with its practical applications in the industry. Such visits motivate students to keep pace with technological advancements and inspire them to explore careers in the telecom sector.

6. Glimpses


Karuna
Aug 30, 2025, 11:37


100G DWDM OTN LINK
GWALIOR - AGRA II
(Via - BHIND)
U-20
GWALIOR- JHANSI
GWALIOR- SHIVPURI
Karuna
Aug 30, 2025, 13:36


SPR-GWR-AGRA10G DWDM SYSTEM
MAKE - HUAWEI
RACK-1
SPR- λ1 TO λ8
MHN- λ9 TO λ16
RACK-2
MRN- λ1 TO λ8
AGRA-λ9 TO λ16
DOC-28-05-2009
GPS Map Camera
Gwalior, Madhya Pradesh, India
55x8+66v, Lalitpur Colony, Lashkar, Gwalior, Madhya Pradesh 474009, India
Lat 26.198034° Long 78.165403°
30/08/2025 02:21 PM GMT +05:30
Google


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Total No of Students: 30

Faculty Coordinator: Dr. Karuna Markam and Ms. Pooja Sahoo

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Attendance Sheet for Industrial Visit

Date:30/08/2025

Student Name	Enrollment Number	Attendance
Aastha Sharma	BTET24O1002	
~~Akshat Yadav~~ Honey Kushwah	BTET24O1015	
Aman Dangi	BTET24O1016	
Aman Sharma	BTET24O1018	
Amit Rathore	BTET24O1019	
Ankit Tomar	BTET24O1025	
Ankita Tripathi	BTET24O1026	
Anshika Gupta	BTET24O1027	
Anshuman Singh Bhadouria	BTET24O1028	
Arshad Khan	BTET24O1032	
Aryan Shrivastava	BTET24O1034	
Ashu Suyash	BTET24O1035	
Ashvi Jadon	BTET24O1036	
Astha Jadon	BTET24O1037	
Ayushi Garg	BTET24O1038	
Deepanshu Yadav	BTET24O1043	
Dhanendra Visvakarma	BTET24O1044	
Hariom Visvakarma	BTET24O1051	
Harsh Arya	BTET24O1052	
Harshit Singh Sikarwar	BTET24O1054	
Harshvardhan Singh	BTET24O1055	
Hiral Verma	BTET24O1056	
Kartik Krishna Kushwah	BTET24O1062	
Kartik Kushwah	BTET24O1063	
Kshitij Kanungo	BTET24O1069	
Lavanya Sachdev	BTET24O1070	
Luv Kush Prajapati	BTET24O1071	
Medhavi Agarwal	BTET24O1075	
Nagendra Singh Sikarwar	BTET24O1079	
Naincy Jain	BTET24O1080	