

JAIPUR METRO RAIL CORPORATION LTD.

REPORT on INDUSTRIAL VISIT

09/07/2018-11/07/2018



**Organised by:
Computer Science Department
Jaipur Engineering College & Research Centre
Jaipur**

Total No. of Student: 150

Faculty Coordinator:

Mr. Gajendra Sharma

Mr. Ashish Ameria

STAFF INVOLVEMENT GROUP (SIG)

1. Pulkit Mathur (DGM S& T)
2. Arun (Chief Controller OCC)
3. Ashish Yadav (JEN)
4. Munesh Meena (JEN)

ABOUT JMRC

Date of incorporation: - 01.01.2010

Date of Commencement of business: - 20.01.2010

Date of Commencement of Commercial operation (Phase 1A):- 03.06.2015

Ministry/Department: - Urban Development & Housing Department, Government of Rajasthan

FACTS ABOUT JAIPUR METRO:

1. The estimated cost of the Jaipur Metro Rail Project is Rs 2025 crores.
2. Jaipur Metro Rail Project is one of the fastest project implementations in Metro sector that was completed in about four years and a quarter.
3. Jaipur Metro project is totally funded by the state government and its agencies, namely, Rajasthan Housing Board, Jaipur Development Authority, Rajasthan State Industrial Development and Investment Corporation Ltd.

4. When it comes to planning, Jaipur Metro is a good example of multi-modal integration, as it is connecting the Railway Station and the Inter-State Bus Terminal; and Metro feeder services are also launched by Jaipur Metro Rail Corporation.
5. As an effort to reduce energy consumption lead to 30 percent energy saving as procured rolling stock uses regenerative braking system.
6. A rainwater harvesting system has also been built into the design.
7. Free drinking water at all the Metro stations.
8. 30 percent of Jaipur Metro's staff are women including operation and maintenance staff, train operators and station controllers.
9. Up to 15% discount has been offered on Smart Cards to encourage their usage.
10. Tourist Cards like One-day Tour Card and Three-day Tour Card, have been introduced, which can be used for unlimited number of trips during the days of their validity.
11. Latest security equipment's have been provided at all Metro Stations

ROLLING STOCK

The Metro uses 1,435 mm (4 ft 8 $\frac{1}{2}$ in) standard gauge rolling stock. Trains are maintained at Mansarovar Depot for Pink Line. In December 2011 BEML was awarded a 318 crore contract to supply 10 four-car trains for Phase 1. The Jaipur Metro plans to lengthen the trains later to 6 coaches as the traffic increases. BEML expects a follow-on order worth 60 crore.

Thus these rolling stocks are said to be indigenous and are manufactured by BEML at its factory in Bangalore. The trains are four-car consists with a capacity of 1506 commuters per train, accommodating 50 seated and 292 standing passengers in each coach. These trains will have CCTV cameras in and outside the coaches, power supply connections inside coaches to charge mobiles and laptops, better humidity control, microprocessor-controlled disc brakes, and will be capable of maintaining an average speed of (20 mph) over a distance of 1.1 km (0.68 mi).

Trains on the metro operate at a maximum speed of 80 km/h (50 mph), and an average speed of (20 mph). Maximum speed is limited to 42 km/h (26 mph) at curves. During operation gate automatically closes and if an object is encountered in between then door takes 3 attempts to close the door and even after attempting, if the door is still not closed then Train Operator again tries to close the door and after all the unsuccessful attempts the door has to be closed by cutting the switch near door as it is door must be closed properly before operating train.

SIGNALING AND TELECOMMUNICATION

The Jaipur Metro uses cab signaling along with a centralized automatic train control system consisting of Automatic Train Protection and automatic train signaling modules. Jaipur Metro has proposed that it will have automatic train operation also in future. A 380 MHz digital trunked TETRA radio communication system from Cascadian is used on all lines to carry both voice and data information. An integrated system comprising optical fiber cable, on-train radio, CCTV, and a centralized clock and public address system is used for telecommunication during train operations as well as emergencies.

OPERATIONS

Trains operate at a frequency of 10 to 15 minutes between 6:45 and 21:00 depending peak and off-peak time. Trains operating within the network typically travel at speed up to 40 km/h (25 mph), and stop for about 20–40 seconds at each station. Automated station announcements are recorded in Hindi and English. Many stations have services such as Parking lot, ATMs and mobile recharge. Eating, drinking, smoking, and chewing of gum are prohibited in the entire system. The metro also has a sophisticated fire alarm system for advance warning in emergencies, and fire retardant material is used in trains as well as on the premises of stations. Navigation information will sooner be available on Google Transit. The first coach of every train is reserved for women.

SECURITY

The responsibility of security of Jaipur Metro has been entrusted to Rajasthan Police. Strength of 789 police personnel has been sanctioned for security and policing of Jaipur Metro. Latest security equipments have been provided at all Metro Stations. Closed-circuit cameras are used to monitor trains and stations, and feed from these is monitored by Rajasthan Police and Jaipur Metro authorities at their respective control rooms. In addition metal detectors, X-ray baggage inspection systems. Each of the underground stations has about 45 to 50 cameras installed while the elevated stations have about 16 to 20 cameras each. The monitoring of these cameras is done by the Rajasthan Police, which is in charge of security of the Metro, as well as the Jaipur Metro Rail Corporation. Intercoms are provided in each train car for emergency communication between the passengers and the train operator. Periodic security drills are carried out at stations and on trains to ensure preparedness of security agencies in emergency situations.

SCADA FOR OPERATION

Supervisory control and data acquisition (SCADA) is a control system architecture that uses computers, networked data communications and graphical user interfaces for high-level process supervisory management, but uses other peripheral devices such as programmable logic

controllers and discrete PID controllers to interface to the process plant or machinery. The operator interfaces which enable monitoring and the issuing of process commands, such as controller set point changes, are handled through the SCADA supervisory computer system. However, the real-time control logic or controller calculations are performed by networked modules which connect to the field sensors and actuators.

TRAIN INTEGRATED MANAGEMENT SYSTEM (TIMS)

Train Integrated Management System (TIMS) is a train information system that performs continuous monitoring of control information in the driving cab and in instruments for monitoring as well as checks on train status to ease the burden on operators and conductors, to properly provide emergency information to the train crew and to streamline the checking procedure.

With integrated control of train-mounted devices using software logic and serial transmission, the system makes the train car system simpler and more reliable, establishing an optimal train car system.

Integrated train car management function

- Overall train control (optimal control)**

Optimal powering and braking depending on the loading conditions of the entire train

Effects: Effective use of regenerative braking equipment, enhanced response to speed control, compensation for the braking strength of the whole train at times of brake failure

- Response confirmation function**

Control for initiation/termination of train car operation (with pantographs up/down - SIV on/off - lighting and air conditioning on/off)

Effects: Improved safety of control and easier detection of causes of failure

- Safety interlock**

Thorough check on conditions for activation of doors, brake failure, operation of safety brakes in response to powering commands

Effects: Minute safety functions that cannot be provided by hardware can be supported by software logic.

Approval Letter from Organization

To

The Principal
JECRC, Jaipur

Date: 04-07-2018

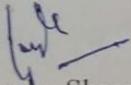
Subject: Approval for three day Industrial Visit to JMRC Jaipur.

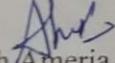
Respected Sir,

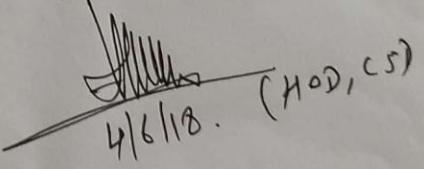
As per the undergoing 15 days internship of III semester students, CSE department want to organize a three days industrial visit to the students for industry exposure to JMRC Ltd., Jaipur. Students will visit the JMRC in the batch of 50 on 9th, 10th, 11th of July '18 along with two faculty members.

Hereby I am attaching the approval of visit from the concern authority of JMRC. Kindly permit us to visit on scheduled dates and arrange transport facility as required.

Thanks & Regards


Gajendra Sharma


Ashish Ameria
(Coordinator Industrial visit, CSE)
JECRC, Jaipur

*Forwarded to Principal Sir,
for approval.*

4/6/18. (HOD, CSE)

*Approved
V. (Signature) 6/7/18*



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List Of Students

**Jaipur Engineering College and Research Centre
Industrial visit at Jaipur Metro Rail Corporation (JMRC)**

Branch : CSE, Section - D...		Attendance Sheet	
Sr. No.	Students Name	Contact No.	Date of Visit : 10 July 2018... Signature
1	Diyush Bohra	9461269758	Diyush
2	HRIZNIK JAIN	9680382171	Jain
3.	Aditya Porwal	9521585890	Aditya
4.	Gaurav Singhvi	8963842067	Gaurav
5.	Priyanshi Khandelwal	6376986229	Priyanshi
6.	Kanishka Sharma	909313012	Kanishka
7.	Smiti Khanwani	8384934478	Smiti
8.	Diya Patel	9001038415	Diya
9.	Shweta Jain	7062423789	Shweta
10.	Pradyuman Ojha	9461132352	Pradyuman
11	Lakshya Sharma	9694924836	Lakshya
12	Aditya Suriya	9588838456	Aditya
13.	Akshit Patel	855995339	Akshit
14	Rauth Chahria	7597560345	Rauth
15.	Rajat Arya	9672953219	Rajat
16.	Ayush Jain	8560957014	Ayush
17.	PRAMVEER CHOUHAN	8104130701	Pramveer
18.	Keshav Jangid	8829810313	Keshav
19.	Abhishek Kumar	9166207131	Abhishek
20.	Sarvagya Sharma	8387983578	Sarvagya
21.	Girish Garg	8233318391	Girish
22	Shivansh Maheshwari	9462988268	Shivansh
23.	Vishal Choudhary	7014167661	Vishal
24	Alok Jain	7329973006	Alok
25	Puru Agarwal	7239931514	Puru
26	Gaurav Sharma	9413924673	Gaurav
27	Dharmesh Kochhar	9660168385	Dharmesh
28	Harshit R Sharma	8239200828	Harshit
29	Himanshu Jain	9521852444	Himanshu
30	Rash Kumar Tyagi	9672628776	Rash



Jaipur Engineering College and Research Centre
Industrial visit at Jaipur Metro Rail Corporation (JMRC)

Branch : CSE, Section - D.....

Attendance Sheet

Date of Visit : 10/7/18

Sr. No.	Students Name	Contact No.	Signature
31	Shubham Sharma	7688840931	Shubham
32	Shubham Tijori	9079713437	Shubham
33	Aman Matoliya	9024415178	Aman
34	Kartik Katara	9588871215	Kartik
35	Anuj Parasar	9785516265	Anuj
36	Abhishek Tiwari	7297000119	Abhishek
37	Prakash Singh Rojewat	7568293633	Prakash
38	Piyush Mantur	9116519139	Piyush
39	Rajan Tha	8233989962	Rajan (Faculty)
40	B. Umamaheswari	7014199072	B. Umamaheswari (II)

Jaipur Engineering College and Research Centre
Industrial visit at Jaipur Metro Rail Corporation (JMRC)

Branch : CSE, Section - B

Attendance Sheet

Date of Visit : 10/7/18

Sr. No.	Students Name	Contact No.	Signature
1.	LAVEENA GANGWANI	7014751520	Laveena
2.	Meenakshi Podamya	9511551124	Meenakshi
3.	Naini Goyal	9479293189	Naini
4.	Kunal Yaduvanshi	7976603138	Kunal
5.	Malvika Kushwah	9079925211	Malvika
6.	Kishore Singh	911931489	Kishore
7.	Hinal Sharma	9588077318	Hinal
8.	Laxit Vade	9653788253	Laxit
9.	Keshav Singh	9982761929	Keshav
10.	Prateek Jain	7737451308	Prateek
11.	Kritik Jain	9414409011	Kritik
12.	Kartik Sharma	8302583192	Kartik
13.	Titendra Sharma	8107123435	Titendra
14.	Pratima Ray Gupta	706836066	Pratima
15.	Prakhar Bhattacharya	8824655471	Prakhar
16.	Divish Sharma	7688840442	Divish



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Jaipur Engineering College and Research Centre
Industrial visit at Jaipur Metro Rail Corporation (JMRC)

Branch : CSE, Section - ...B...

Attendance Sheet

Date of Visit : 9-07-2018

Sr. No.	Students Name	Contact No.	Signature
①	Nikhil Nagar	9462102575	Nikhil
②	Nikita Rathore	9887506333	Nikita
③	Nipunika Upadhyay	9828390929	Nipunika
④	Kratika Jain	9314502340	Kratika
⑤	Ishita Motiani	9782405622	Ishita
⑥	Manish Raj	8340229351	Manish
⑦	MD Shadab Khan	6200317623	MD Shadab
⑧	Narendra Singh	7023019655	Narendra
⑨	Praween Godara	8947858543	Praween
⑩	Dakshya Sharma	7597551115	Dakshya
⑪	Pratham Naing	8824966721	Pratham
⑫	Pradyumna Patel	9828819951	Pradyumna
13.	Manish Garg	9694973773	Manish
14.	Keshav Kalsra	9782893333	Keshav
15.	Jayesh Joshi	8529586949	Jayesh
16.	Khyati Jha	7742276728	Khyati
17.	Tarun Dhabhai	9079801500	Tarun
18.	Tanmay Kumawat	9057539699	Tanmay

Jaipur Engineering College and Research Centre
Industrial visit at Jaipur Metro Rail Corporation (JMRC)

Branch : CSE, Section - C

Attendance Sheet

Date of Visit : 9/7/18

Sr. No.	Students Name	Contact No.	Signature
1.	Piyush gupta	9660218108	Piyush
2.	Riya Goyal	7073273685	Riya.
3.	Tanu Priya	8340569489	Tanu
4.	Sounya Hiranandani	2890521344	Sounya
5.	Rahul Singh Chauhan	8107738282	Rahul
6.	Mann Vaishnav	9588259869	Mann
7.	Piyush Guenari	7727929075.	Piyush
8.	Prasoon Dashora	9649918747	Prasoon
9.	Naman Jain	929798645.	Naman.
10.	Mohit Jain	8561011555	Mohit.
11.	Praywal Rathi	9460110707	Praywal
12.	Katyam Sahay	9905032646	Katyam
13.	Vinay Gupta	9079395649	Vinay
14.	Rupesh Kumar	7062835847	Rupesh
15.	Raynak Sodhi	7340619030	Raynak
16.	Tanmay Barshar	9982996563	Tanmay
17.	Saurabh Kumar Rai	9140537044	Saurabh
18.	Saurabh Sharma	9057877312	Saurabh
19.	Sarthak Kohaliya	8764098870	Sarthak
20.	Sparsh Jain	7014556452	Sparsh
21.	Priyanka Vijay	9587980827	Priyanka
22.	Sukhir Agarwal	9529361561	Sukhir
23.	Sidali Maheshwari	9653188927	Sidali
24.	Yash Agrawal	9950148282	Yash Agrawal
25.	Sohil Tolkhare	8562858562	Sohil
26.	Taru Khandelwal	9116074614	Taru
27.	Priyanshi Rajoriya	9079865930	Priyanshi
28.	Sakshi singhal	9782338966	Sakshi
29.	Rajni Sharma	9772751451	Rajni
30.	Jahanvi singh	7568117008	Jahanvi

Jaipur Engineering College and Research Centre
Industrial visit at Jaipur Metro Rail Corporation (JMRC)

Attendance Sheet

Branch : CSE, Section - A

Date of Visit : 11/07/18

Sr. No.	Students Name	Contact No.	Signature
1	Uchiraj Jain	7742125948	Uchiraj
2.	Ananya Parashar	9785510205	Ananya
3.	Ankit Kumar	9903602213	Ankit
4	Aman Matoliya	9024415678	Aman
5	Girish Gang	8233318331	Girish

Jaipur Engineering College and Research Centre
Industrial visit at Jaipur Metro Rail Corporation (JMRC)

Attendance Sheet

Branch : CSE, Section - C

Date of Visit :

09/07/18

Sr. No.	Students Name	Contact No.	Signature
1	Punnet Garg	7791992675	Garg
2	Rakshit Rawal	9460330851	Rakshit
3	Samyak Jain	8093940321	Samyak
4	Shubham Kumar	9461292369	Shubham
5	Sachin Sharma	9413911622	Sachin
6	Rajeev Poria	9664396166	Rajeev Poria
7	Rajender Porsad Dhaka	8780026335	Rajender Porsad Dhaka
8	Pradhuman Ojha	8949398894	Pradhuman Ojha
9	Aditya Surendra	9588838456	Aditya
10	Marek Tyagi	9672628776	Marek
11	Ayush Jain	8560987014	Ayush
12	Himelit Mather	9461587164	Himelit
13	Anuj Porwal	9785516265	Anuj
14	Chandan Kumar	7979880834	Chandan
15	Deeraj Singh	9588961970	Deeraj Singh
16	Paresh Lachan Chawla	7591560345	Paresh
17	Girish Garg	8233318391	Girish Garg
18	Chirag Jam	7742125948	Chirag
19	Aashish Chauhan	8400040002	Aashish
20	Kartik Lalwani	9988871215	Kartik Lalwani

Jaipur Engineering College and Research Centre
Industrial visit at Jaipur Metro Rail Corporation (JMRC)

Attendance Sheet

Branch : CSE, Section - A.....

Date of Visit : 11/07/18

Sr. No.	Students Name	Contact No.	Signature
1	Vijay Dhakad	9660640612	
2	Rupesh Kumar	7062835847	
3	Riya Goyal	7073273685	
4	Vikash Beniwal	8094976365	
5	Rajendra Prasad Dhaka	8780026335	
6	Shubham Kumar	9461292369	
7	Shivraj Swami	9116304579	
8	Puneet Mary	7791992675	
9	Rajeev Paroi	9664396166	
10	Rakshit Porwal	9460330851	
11	Spanish Jain	8769055893	
12	Ramneek Sandhu	7062835847	
13	Shubham Modi	7231083618	
14	Sumit Gupta	7690048858	
15	Yash Agarwal	9950148282	
16	Yash Yadlu	9413742783	
17	Vinay Gupta	9079395649	
18	Tarun Dhatbar	9079801500	
19	Tanmay Parashar	9982996563	
20	Tamu Priya	8340569489	

Visit Pictures



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[Handwritten signature]
Head of the Department
Computer Science & Engineering
JECRC, Jaipur