

G H PATEL COLLEGE OF ENGINEERING & TECHNOLOGY
(THE CHARUTAR VIDYA MANDAL (CVM) UNIVERSITY)



INDUSTRIAL VISIT REPORT

Visit to-INDO GERMAN TOOL ROOM (IGTR), AHMEDABAD – VATVA.

As a part of SUBJECT: MACHNINING PROCESSES (102100304)

Class: 2nd Year B.Tech Mechatronics Engineering

Academic Year: 2026-27

Date of Visit: 14-08-2026

Faculty Coordinators: DR. SAURIN SETH, MR. HEMANT RATHOD



INTRODUCTION

Industrial visits are an important part of engineering education as they provide students with an opportunity to observe the practical implementation of theoretical concepts in a real industrial environment. Such visits help students understand modern technologies, manufacturing processes, industrial practices, and the importance of technical skills beyond classroom learning.

As part of the academic activities of the Department of Mechatronics Engineering, G H Patel College of Engineering & Technology (GCET), Anand, the Second Year B.Tech. Mechatronics Engineering students visited Indo German Tool Room (IGTR), Ahmedabad – Vatva. The visit was organized to provide students with practical exposure to advanced manufacturing and automation technologies.

IGTR Ahmedabad is a technology and training centre that works in areas such as tool and die manufacturing, precision machining, CNC technology, CAD/CAM/CAE, quality inspection, rapid prototyping, robotics, and Mechatronics. These areas are closely related to the field of Mechatronics Engineering and provide students with valuable industrial exposure.

During the visit, students were introduced to various CNC machines, CAD/CAM facilities, EDM and wire-cut EDM, robotics and Mechatronics systems, precision measurement equipment, rapid prototyping, injection moulding, and tool and die manufacturing facilities. The technical staff explained the working principles, applications, and importance of these technologies in modern industries.

The visit also helped students understand how mechanical systems, electronics, sensors, control systems, programming, and automation are integrated to develop modern industrial systems. It provided an opportunity to relate concepts learned in subjects such as manufacturing, CAD/CAM, robotics, control systems, electronics, and programming to their practical applications. Overall, the industrial visit was a valuable learning experience that helped bridge the gap between theoretical knowledge and practical industrial applications and increased students' awareness of the technologies, skills, and practices required in the modern manufacturing and Mechatronics industry.

VISIT DETAILS

College- G H Patel College of Engineering & Technology (GCET), Anand

Department- Mechatronics Engineering

Class-2nd Year B.Tech.

Academic Year- 2026-27

Institute Visited-Indo German Tool Room (IGTR)

Location-Vatva, Ahmedabad, Gujarat

Date of Visit-14-08-2026

Number of Students-74

Faculty Coordinators-DR. SAURIN SETH, MR. HEMANT RATHOD



OBJECTIVES OF THE INDUSTRIAL VISIT

The main objectives of the industrial visit were:

1. To provide students with practical exposure to a modern industrial and manufacturing environment.
2. To understand the working principles and applications of advanced manufacturing technologies.
3. To observe CNC machines and understand their role in precision manufacturing.
4. To understand the relationship between CAD, CAM, and CNC machining.
5. To gain practical knowledge about robotics, automation, sensors, and control systems.
6. To understand the importance of precision measurement, tolerances, and quality control.
7. To observe modern processes such as EDM, wire-cut EDM, and rapid prototyping.
8. To understand the applications of tool and die manufacturing in industries.
9. To connect theoretical concepts studied in the Mechatronics Engineering curriculum with practical applications.
10. To create awareness about technical skills and career opportunities in manufacturing, robotics, and automation.

ABOUT INDO GERMAN TOOL ROOM (IGTR)

Indo German Tool Room (IGTR), Ahmedabad is a Government of India technology and training centre located at Vatva, Ahmedabad, Gujarat

IGTR provides technical training, manufacturing services, and technology-related facilities in areas such as tool and die manufacturing, precision machining, CAD/CAM/CAE, CNC machining, inspection, product development, rapid prototyping, robotics, and Mechatronics.

The organization plays an important role in providing technical knowledge and practical training related to modern manufacturing technologies.

For Mechatronics Engineering students, IGTR is particularly relevant because many of its technologies involve the integration of mechanical systems with electronics, computer control, sensors, programming, and automation.

FACILITIES / DEPARTMENTS VISITED

During the visit, the students were introduced to various technical facilities and manufacturing areas.

5.1 CAD/CAM/CAE FACILITIES

CAD stands for Computer-Aided Design, CAM stands for Computer-Aided Manufacturing, and CAE stands for Computer-Aided Engineering.

5.2 CNC MACHINING

CNC stands for Computer Numerical Control. CNC machines are computer-controlled machine tools used for manufacturing components with high accuracy and repeatability.

- CNC programming
- Tool movement
- Cutting tools
- Feed rate
- Spindle speed
- Workpiece setup
- Automated machining

5.3 CNC MILLING AND TURNING

CNC Milling uses a rotating cutting tool to remove material from a workpiece. It is commonly used for operations such as facing, drilling, slotting, pocketing, and contouring.

CNC TURNING is mainly used to manufacture cylindrical components. The workpiece rotates while a cutting tool removes material.

5.4 EDM AND WIRE-CUT EDM

Electrical Discharge Machining (EDM) is a non-traditional machining process that uses controlled electrical discharges to remove material from electrically conductive workpieces. Wire-cut EDM uses a thin electrically conductive wire to cut complex and accurate profiles.

5.5 ROBOTICS AND MECHATRONICS

The Robotics and Mechatronics facilities were particularly relevant to our branch.

Students learned that a robotic system generally consists of:

- Mechanical structure
- Motors and actuators
- Sensors
- Controller
- End effector
- Programming system

Industrial robots can be programmed to perform repetitive and precise operations, improving productivity and consistency.

This demonstrated the integration of:

Mechanical Systems + Electronics + Sensors + Control + Programming + Automation

5.6 PRECISION INSPECTION AND METROLOGY

Metrology deals with the science of measurement. Students were introduced to the importance of dimensional inspection and quality control in manufacturing.

Precision inspection may involve equipment such as:

- Height gauges
- Tool maker's microscope
- Hardness testing equipment
- Coordinate Measuring Machine (CMM)
- Surface measurement equipment

5.7 COORDINATE MEASURING MACHINE (CMM)

A Coordinate Measuring Machine (CMM) is used to measure the coordinates and geometrical features of a component with high precision. It can be used to inspect:

- Length and dimensions
- Hole positions
- Profiles
- Geometrical features
- Dimensional accuracy

5.8 RAPID PROTOTYPING

Rapid prototyping allows physical prototypes to be produced from digital designs.

The general process is:

3D CAD Model → Digital Preparation → Layer-by-Layer Manufacturing → Physical Prototype.

It is useful for product development, design verification, prototype testing, and manufacturing complex shapes. Students gained an understanding of how digital engineering designs can be converted into physical components.

5.9 INJECTION MOULDING

Injection moulding is commonly used to manufacture plastic components.

The basic process involves:

1. Heating and melting the plastic material.
2. Injecting the molten material into a mould.
3. Allowing it to cool.
4. Removing the finished component.

TECHNICAL OBSERVATIONS

The major technical observations made during the visit were:

- CNC machines enable accurate and repeatable manufacturing.
- CAD/CAM provides a link between product design and manufacturing.
- Automation reduces repetitive manual operations.
- Robotics can improve productivity and consistency.
- Sensors and controllers are essential in automated systems.
- EDM can be used for precision machining of difficult materials.
- Precision measurement is essential for maintaining product quality.
- Manufacturing processes must be selected according to material, geometry, accuracy, and surface-finish requirements.
- Modern manufacturing combines mechanical, electrical, electronic, and computer technologies.

RELEVANCE TO MECHATRONICS ENGINEERING

The visit was highly relevant to Mechatronics Engineering because it demonstrated the practical integration of different engineering disciplines. The major areas observed can be related to:

- Mechatronics Area| Industrial Application

- Mechanical Systems| CNC machines and machine tools
- Electronics| Machine control systems
- Sensors| Position and process feedback
- Motors & Drives| CNC and robotic movement
- Control Systems| Automated machine operation
- Programming| CNC and robotic systems
- CAD/CAM| Design and manufacturing
- Robotics| Industrial automation
- Metrology| Precision inspection

The visit helped students understand that Mechatronics involves the integration of mechanical, electrical, electronic, computer, and control technologies.

LEARNING OUTCOMES

After completing the industrial visit, students gained:

1. Practical understanding of modern manufacturing technologies.
2. Knowledge of CNC machining and its industrial applications.
3. Understanding of CAD/CAM integration.
4. Awareness of robotics and industrial automation.
5. Knowledge of precision measurement and quality control.
6. Understanding of EDM and other advanced machining processes.
7. Awareness of rapid prototyping and modern product development.
8. Better understanding of tool and die manufacturing.
9. Ability to relate theoretical concepts with practical industrial applications.
10. Awareness of career opportunities in Mechatronics, robotics, automation, manufacturing, CNC, and CAD/CAM.

BENEFITS OF THE INDUSTRIAL VISIT

The visit provided several important benefits to the students:

- Improved practical understanding of engineering concepts.
- Exposure to modern industrial equipment.

- Better understanding of manufacturing processes.
- Awareness of automation and robotics.
- Understanding of industrial quality requirements.
- Knowledge of precision engineering.
- Interaction with technical professionals.
- Awareness of industry-oriented skills.
- Motivation to develop practical and technical knowledge.

CONCLUSION

The industrial visit to Indo German Tool Room (IGTR), Ahmedabad – Vatva was an informative and valuable learning experience for the 2nd Year Mechatronics Engineering students of GCET.

The visit provided practical exposure to CNC machining, CAD/CAM, EDM, robotics, automation, metrology, rapid prototyping, injection moulding, and tool and die manufacturing.

It helped students understand how theoretical concepts are applied in real industrial situations and demonstrated the importance of integrating mechanical systems, electronics, sensors, control systems, programming, and automation.

Overall, the visit successfully bridged the gap between classroom learning and industrial practice and encouraged students to develop the technical and practical skills required for their future careers in Mechatronics and advanced manufacturing.

REFERENCES

1. Indo German Tool Room (IGTR), Ahmedabad – Official information.
2. IGTR Ahmedabad – Facility and training information.
3. Technical information provided by IGTR staff during the industrial visit.

CVM
UNIVERSITY

G H Patel College of Engineering and Technology

(A Constituent Institute of CVM University)

Mechatronics Department

Industrial Visit to Indo German Tool Room (IGTR)

Date : 14/08/2026

Time : 09:00 AM to 04:00 PM

GCET
G H PATEL COLLEGE OF
ENGINEERING & TECHNOLOGY

Sr. No.	Enrolment No.	Name	Signature
1	12402100501030	SUKHADIYA VAIDIK MANISH	
2	12502100501001	ABHIJEET NAIR	Abhi
3	12502100501002	GOPANI ADITYA MAHESHKUMAR	Aditya
4	12502100501003	VISHWAKARMA APOORV ANIL	Apoorv
5	12502100501004	PATEL ARYAN BHAVIK	Aryan
6	12502100501005	NADA ARYAN JITENDRA	Aryan
7	12502100501006	PATEL BHAAVAN DILIPBHAI	Bhaavan
8	12502100501007	PANCHAL DAKSH KIRITBHAI	Daksh
9	12502100501008	DARSHAN RAKESH CHANGRANI	Darshan
10	12502100501009	DEVALKUMAR JAYANTIBHAI PATEL	Deval
11	12502100501010	GHEVARIYA DHURV GHANSHYAMBHAI	Dhurv
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13	12502100501012	PATEL DHVIP	Dhvip
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15	12502100501014	VASANI GAURAV ATULBHAI	Gaurav
16	12502100501015	BHATT HET ASHUTOSHKUMAR	Het
17	12502100501016	JASANI HET DINESHBHAI	Het
18	12502100501017	VALA HIREN BHARATBHAI	Hiren
19	12502100501018	JAINIL PATEL	Jainil
20	12502100501019	JAIVIK BAROT	Jaivik
21	12502100501020	ROHIT JAYMIN SURESHBHAI	Rohit
22	12502100501021	PATEL JEEL JITENDRAKUMAR	Jeel
23	12502100501022	PATEL KAVYA BRIJESH	Kavya
24	12502100501023	KAVYA HIMANSHU BHODIA	Kavya
25	12502100501024	GOYANI KRISHIV JAYESHBHAI	Krishiv
26	12502100501025	VAGHASIYA KRISHNA NILESHBHAI	Krishna
27	12502100501026	LOLADIYA KRIYANS PIYUSH	Kriyans
28	12502100501027	PATEL MAHARSHI BHAUMIK	Maharshi
29	12502100501028	SOLANKI MANTHAN BHAVINBHAI	Mant
30	12502100501029	MEET PURANIK	Meet
31	12502100501030	VADI MEET ASHVINBHAI	Meet
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33	12502100501032	BLAWALA MOHMMED AYAZ SARFARAZ	Ayaz
34	12502100501033	NAKUL PACHAURI	Nakul

(Mr. Hemant Rathod)

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36	12502100501035	NIKHIL MANGUKIYA	Nikhil
37	12502100501036	PATEL NISARG ASHISHKUMAR	Nisarg
38	12502100501037	SHAH NISHIT SANDIPKUMAR	Nishit
39	12502100501038	NAKRANI PAL PARESHBHAI	Pal
40	12502100501039	GAJERA PARTH PIYUSHBHAI	P. Gajera
41	12502100501040	PATEL PRANSHULKUMAR	Pranshul
42	12502100501041	MEVADA PRINS ASHOKBHAI	
43	12502100501042	BHOJANI PRIYANSHU AMBARAMBHAI	Pranshul
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45	12502100501044	PATEL PRUTHVI PANKAJKUMAR	P. Pruthvi
46	12502100501045	RISHI NAISHADKUMAR PATEL	
47	12502100501046	RUDRA AMIN	Rudra
48	12502100501047	RAJPUT RUDRA CHIRAGKUMAR	R. C. Rajput
49	12502100501048	RUDRA HIRALKUMAR PATEL	R. H. Patel
50	12502100501049	SIDDHAPARA RUDRA JAGDISHBHAI	R. J. Jagdish
51	12502100501050	PATIL RUSHIKESH RAJESH	Rushikesh
52	12502100501051	PATEL SANKET VIPULBHAI	Sanket
53	12502100501052	PATEL SHAIL SANJAYKUMAR	Shail
54	12502100501053	SHIVANI YADAV	Shivani
55	12502100501054	PATEL SHIVANSH YOGESHKUMAR	Shivansh
56	12502100501055	MENDPARA SHREYASH KALPESHBHAI	Shreyash
57	12502100501056	SHUBH KUNTALKUMAR PATEL	Shubh
58	12502100501057	SMIT MAHENDRAKUMAR PATEL	Smit
59	12502100501058	SMIT VINAYKUMAR LAD	Smit
60	12502100501059	PATEL SNEH PARESHKUMAR	Sneh
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62	12502100501061	TITHI DHAVALSINH BARAD	Tithi
63	12502100501062	SHETH UDITA KASHYAP	Udita
64	12502100501063	ROHIT UTSAV HASMUKHBHAI	Rohit
65	12502100501064	LUHANA VARUN	Varun
66	12502100501065	PATEL VED VIPULKUMAR	Ved
67	12502100501066	PATEL VRAJ SUNILBHAI	Vraj
68	12502100501067	MOMIN EJAZHUSAIN MANZOORALI	Momin
69	26MCD002	Krishna V. Pandey	K. V. P.
70	26MCD002	Bharya C. Kunguwa	Bharya
71	26MCD005	Rudra D. Mishra	Rudra
72	26MCD001	Shlok A. Pandey	Shlok
73	26MCD001	Sheth Harsh M	Sheth
74	26MCD003	Kesava Chaudhary	Kesava
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