

Gujarat Technological University



International Experience Program- (2025)

University of Szczecin, Poland
Organized by: University of Wismar,
Germany

Mechanical Engineering

Report By:

Prof. Kedar H Badheka

The students, attended by their mentor, Prof. Kedar H. Badheka, assembled at Sardar Vallabhbhai Patel International Airport in Ahmedabad at 10:30 p.m. on the 09th of July, 2025. On the evening before their flight to Berlin, Germany. Their journey began at 3:55 a.m. (10th July 2025) the following morning, and excitement ran high as they breezed through security and completed immigration without difficulty.



Student group with mentor after completion of security check and immigration at Sardar Vallabhbhai Patel International Airport, Ahmedabad.

After arriving at Hamad International Airport in Doha for a brief layover, the group boarded its connecting flight to Berlin International Airport. Upon arrival in Berlin, there was a brief delay at immigration, during which some queries were directed to the mentor regarding the program and its objectives. These were resolved efficiently at the airport. The group exited Berlin International Airport at 9:50 PM, where they were warmly welcomed by Prof. Norbert. Following the welcome, the group proceeded by bus—arranged by the university—to Szczecin, Poland.

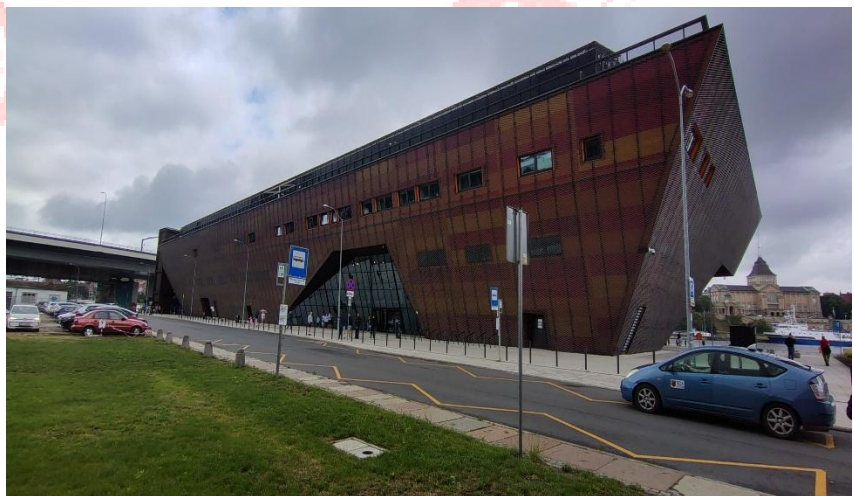
The group of students reached Szczecin after undergoing a routine police verification at the Poland border and arrived at the hostel by 1:00 AM. (10th July 2025) Prof. Małgorzata also provided valuable assistance in helping the students gather essential items from nearby stores.

Day	Date	Activities
Day 1	11/072025 (Friday)	At 9:00 AM sharp, all the students gathered on the ground floor to meet Prof. Norbert and Prof. Małgorzata. They provided a briefing about the program and distributed some essential utensils and other necessary kitchen items.

Students were instructed to check their rooms, unpack their luggage, and take photographs of the room's furnishings and other necessary items for record-keeping.

Prof. Norbert and Prof. Małgorzata then accompanied me to the tram office to obtain monthly tram passes. These passes were handed over to the students, allowing them to travel freely within the city of Szczecin for the entire month.

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| Day 2 | 12/07/2025
(Saturday) | It was a free day for the students to explore the city and settle into their new environment. |
| Day 3 | 13/07/2025
(Sunday) | Surprise Visit was schedule for us by the Prof. Malgorzata to Visit the Marine/Ship Museum to explore the working of ship and various departmental functions of ship. |



Day	Date	Activities
Day 4	14/07/2025 (Monday)	<p>Prof. Malgorzata arrived at the hostel promptly at 8:15 a.m. to escort all the students to the university by tram. She guided the students on how to use the tram system, explained important rules, and informed them where tram changes were required. The group reached the University of Szczecin by 8:45 a.m., and the official program was scheduled to begin at 9:00 a.m.</p> <p>The actual teaching program commenced on 14th July 2025, beginning with an orientation session.</p>



The orientation started with the introduction of all the present delegates, including Prof. Sebastian Majewski, Director of the University of Szczecin; Prof. Agnieszka Majewski, International Exchange Coordinator; Prof. Norbert; Prof. Henrik Schnegas; and Prof. Malgorzata.

The program began with the GTU song, followed by a token of appreciation presented to the Director of the University of Szczecin on behalf of Gujarat Technological University.



Along with the symbolic gift of the “Charkha,” a brief discussion was held on Mahatma Gandhi and his contributions to India’s

independence. The Director deeply appreciated this thoughtful token of love and expressed heartfelt thanks to the university management, acknowledging the significance of the gesture.

From 10: 00 a.m. onwards teaching was started.

Learned about: History of Germany, Poland and subject

Basics of Design of Machine Elements with shaft & hub

Day 5 15/07/2025
(Tuesday) From Morning 9:00 a.m. to 1:00 p.m. onwards classes were commenced for the students of Design of Machine Elements.

Learned about: shaft & hub

Day 6 16/07/2025
(Wednesday) From Morning 9:00 a.m. to 1:00 p.m. onwards classes were commenced for the students of Design of Machine Elements.

Learned about: Design of Pins and Bolts

Day 7 17/07/2025
(Thursday) From Morning 9:00 a.m. to 1:00 p.m. onwards classes were commenced for the students of Design of Machine Elements.

Learned about: Design of Screw and fasteners

Day 8 18/07/2025
(Friday) **Teaching off- Self Study**

An Assignment based work given to all the students and they have to solve the example for the next three days.

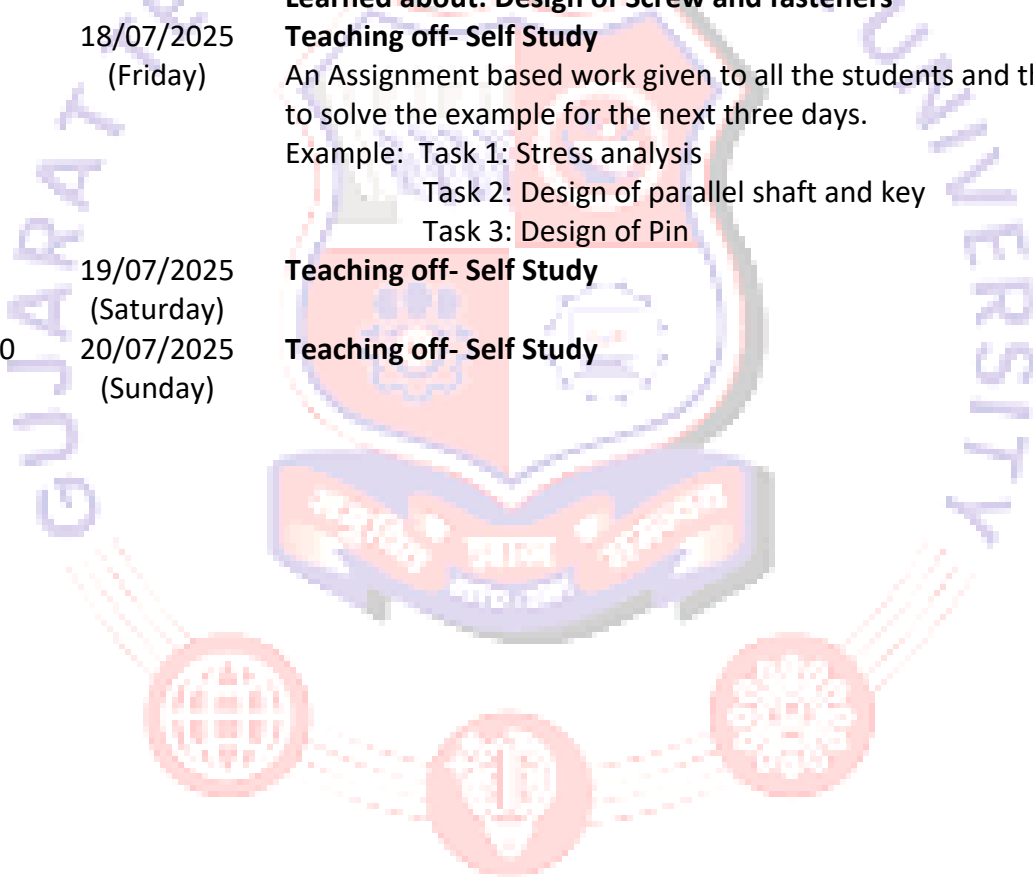
Example: Task 1: Stress analysis

Task 2: Design of parallel shaft and key

Task 3: Design of Pin

Day 9 19/07/2025
(Saturday) **Teaching off- Self Study**

Day 10 20/07/2025
(Sunday) **Teaching off- Self Study**



Day	Date	Activities
Day 11	21/07/2025 (Monday)	From Morning 9:00 a.m. to 1:00 p.m. onwards classes were commenced for the students of Design of Machine Elements. Learned about: Design of Breaks & Clutch
Day 12	22/07/2025 (Tuesday)	From Morning 9:00 a.m. to 1:00 p.m. onwards classes were commenced for the students of Design of Machine Elements. Learned about: Design of Bearing and Lifetime Reliability
Day 13	23/07/2025 (Wednesday)	Design of Machine Elements Exam Details The Design of Machine Elements subject exam was conducted on 23rd July 2025 . The exam commenced at 9:00 AM and concluded at 11:30 AM according to Szczecin local time .



Day 14	24/07/2025 (Thursday)	Second Subject study started: Quality & Reliability Engineering Lecture Timing: 9:00 to 1:00 PM Discuss was started on Quality and Reliability Engineering, Quality Practices, What is Quality & History, Quality guru's Quality Circle FMEA- Failure Mode Effect Analysis FTA- Fault Tree Analysis Fishbone Diagram/ Ishikawa Diagram Institute Visit Summary – 23rd July 2025 On 23rd July 2025 , at 4:00 PM , a visit to an esteemed institution was organized under the guidance of Prof. Norbert . The visit took place at the University of Maritime, Szczecin —one of the renowned institutes in Poland. During the visit, students gained valuable insights into several advanced technologies, including:
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- **Automation in pick-and-place robots** featuring **six-arm functionality**

- **Robotics applications in inspection, quality control, and testing**
- **3D printing and scanning technologies**, along with their practical applications in the **maritime field**
- **Mapping tools and software** used in maritime navigation and surveying

This visit provided the students with a comprehensive understanding of how modern technologies are being integrated into maritime engineering and operations.

In addition to the technical visit, a special lecture was delivered by a professional expert from GARO Technologies on the topic of:

“Electric Charging Station Design and Future Aspects”

The lecture was conducted by **Prof. Stanisław Iwan**, Dean of the Faculty of Economics and Transport Engineering, providing students with valuable insights into the evolving infrastructure for electric mobility and its future potential.





Visiting Ship Engine laboratory



Group photo at Maritime University of Szczecin, Poland

Day 15 25/07/2025
(Friday)

Excursion Program:

Swinoujscie, Beach near Germany-Poland Border

Educational Visit to Świnoujście and Uznam Island – 23rd July 2025

The day began early, with students assembling at 7:00 AM at the DOM-3 Hostel waiting lounge. The group was led and accompanied by Prof. Małgorzata, who provided guidance and support throughout the trip.

The journey commenced from Szczecin Main Station via train, traveling to Świnoujście Station, followed by a ferry transfer to reach Uznam Island.

Świnoujście is a unique and strategic location comprising 44 islands, out of which only three are inhabited. The city stands out as a rare example of a cross-border urban area shared between Poland and Germany.

The visit officially began at 11:00 AM with a stop at the President's Office of Świnoujście, where the group received a warm welcome from the Secretary. A detailed briefing was provided on the administrative functioning of Świnoujście, with an emphasis on how the island is efficiently governed through cross-border cooperation between the two nations. The presentation highlighted the unique governance model, infrastructure, and community integration that defines the region.



Following this, a session was conducted by the **Head of the Department of Investment Affairs**, who discussed ongoing **investment projects** and **future development plans** for Świnoujście. The discussion covered infrastructure expansion, tourism development, and environmental sustainability initiatives aimed at enhancing the region's economic and strategic importance.

At **1:00 PM**, students had the opportunity to explore the **local town and beach area** of Świnoujście, allowing them to experience the cultural and recreational aspects of the coastal city firsthand.

The visit concluded with the group boarding the **3:46 PM train**, returning to **Szczecin Main Station** by approximately **6:15 PM**.



Group photo at President office Swinoujscie, Poland.



Swinoujscie beach, Poland

Day 16	26/07/2025 (Saturday)	Teaching- off : Self-study and Explore the Szczecin
Day 17	27/07/2025 (Sunday)	<p>Teaching- off : Self-study and Explore the Szczecin</p> <p>Visit to the Technology & Transportation Museum, Castle, and Holiday Park – Szczecin</p> <p>As part of the educational and cultural exposure, both students and mentors visited the Technology and Transportation Museum in Szczecin. The visit offered an engaging journey through the history and evolution of transportation and technological innovation. Students explored a wide array of historic inventions and advancements in various domains, including:</p> <ul style="list-style-type: none"> • Cameras, from early mechanical models to modern innovations

- **Gramophones** and their role in the evolution of recorded sound
- **Typewriters**, showcasing the early stages of written communication technology
- Components and exhibits related to **automobile parts, bicycles, motorcycles, and cars**
- Developments in **public transportation**, with a special emphasis on **tram systems**

The museum visit provided a deeper appreciation of how technological innovations have shaped everyday life and urban mobility.

Following the museum tour, the group also visited the **Castle in Szczecin**, gaining insights into the region's rich historical and architectural heritage. To conclude the day on a lighter note, students enjoyed recreational time experiencing a few attractions at a local **holiday park**, adding a fun and memorable touch to the day.



Photo: Technology & Transportation museum Szczecin, Poland

Day	Date	Activities
Day 18	28/07/2025 (Monday)	<p>Industrial Visit to Elektryka Morska, Szczecin, Poland</p> <p>The visit commenced at 8:00 a.m. from the student hostel, coordinated by Prof. Malgorzata Zakrzewska, who received the students and accompanied them to Elektryka Morska.</p> <p>Founded in February 2007, Elektryka Morska is one of the few companies in Europe offering comprehensive electrical marine services — from design, delivery of electrical equipment, and production of switchboards, to installation, approval of existing systems, and preparation of documentation in compliance with classification societies. The company's most valuable asset is its team of skilled professionals, passionate about their work.</p> <p>Prof. Norbert and Prof. Henrik joined the group directly at the company premises. After arrival, students attended a briefing session, which included a presentation by the company's HR and Project Head outlining the scope of work, key projects, and targeted application areas in the marine industry.</p>



Detailed departmental/section visit was to be guided by HR of Elektryka Morska



Electrical Panel manufacturing division



Group Photo at Elektryka Morska, Szczecin, Poland.

Students Learned About:

- Industrial wiring systems and electric cable division
- Electrical panelling systems in the marine service industry

Discussion on Current Projects and Future Opportunities for Students:

- Acoustic emission–based testing systems
- Ultrasound-based devices for ship hull areas to protect marine animals and reduce marine waste.

Linked In Post by Elektryka Morska

https://www.linkedin.com/posts/elektryka-morska_elektrykamorska-empoweringgreenfuture-activity-7355599372727812096-

Day 19 29/07/2025
(Tuesday)

Lecture of Quality & Reliability Engineering
Time: 9: 00 to 12: 00 p.m.

Discussion on topic:

Reliability Engineering & Its Impact, application.

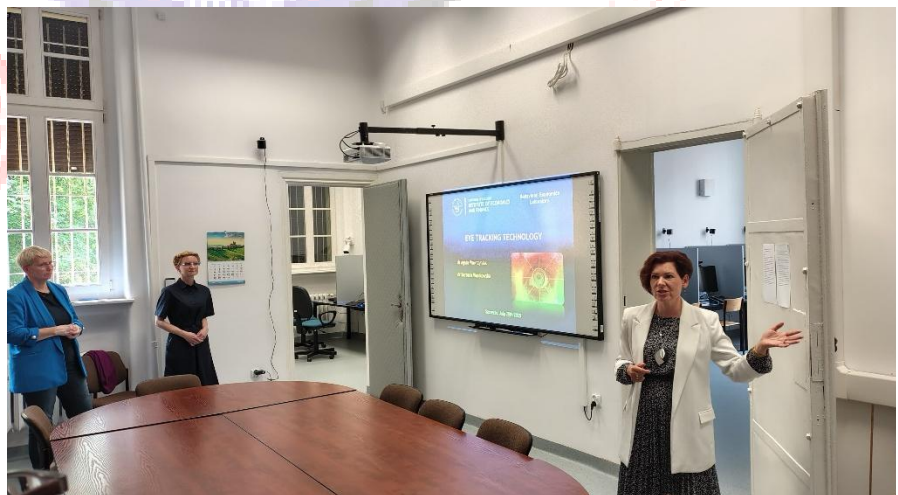
After 12:00 p.m. – Neurobehavioral Laboratory, University of Szczecin

A session was conducted on the eye-tracking system and its applications in the field of mechanical engineering. The session was led by Dr. Agata Wawrzyniak and Dr. Barbara Wasikowska.

Two experiments were carried out using the eye-tracking system, focusing on Neuro-human behavioural responses and their reactions under specific conditions, aiming to analyse and interpret human attention patterns and response times.



Welcome of students at Neuro Behavioural Laboratory, University of Szczecin, Poland.



Presentation & Session followed by Experiements Q & A

Open Forum Discussion:

An open forum was conducted on the possible application fields of **eye-tracking systems** in **mechanical engineering**. The students

Day 20 30/07/2025
(Wednesday)

participated enthusiastically and engaged in the discussion with great curiosity.

Lecture of Quality & Reliability Engineering

Time: 9: 00 to 01: 30 p.m.

Topic Discussed:

Hazard, Industrial hazard and Its Impact and Remedial techniques/ method with industrial example.

Evening Cultural Dinner

In the evening, the students organized a delicious dinner for **Prof. Norbert, Prof. Henrik, Prof. Malgorzata**, and little **Sophie**. The guests were welcomed in traditional Indian style with a tilak ceremony. After a brief exchange of experiences—covering both technical learnings and cultural impressions—the students served a variety of homemade dishes, including **Gujarati** and **Punjabi** cuisine. The guests enjoyed the warm hospitality and appreciated the students' efforts, praising both the invitation and the authentic flavors of the food.



Welcome both the guest with Indian Tradition "Tikal"



Enjoying Indian Tradtional flover of food



Group Photo after dinner evening

Day 21 31/07/2025
(Thursday)

Lecture of Quality & Reliability Engineering

Time: 9: 00 to 01: 30 p.m.

Topic Discussed:

- Hazard & Safety:
- Design Reliability, Inherent Reliability, Field Reliability
- Reliability over Product Life Cycle.

Day 22 01/08/2025
(Friday)

Exam of Quality & Reliability Engineering.

Exam Time: 9:00 to 11:30 a.m.



After the exam session a Presentation was conducted Summer Internship (370001)



Day 23 02/08/2025
(Saturday)

Day 24 03/08/2025
(Sunday)

Presentation given by the student on Individually and evaluated by Prof. Henrik and Myself as an Internal examiner.

Teaching- off : Self-study and Explore the Szczecin city

Industrial Visit – Airbus Manufacturing Facility, Hamburg, Germany

The visit commenced at 6:00 a.m., led by **Prof. Norbert**, with the group traveling towards **Hamburg, Germany**. The team arrived around 12:30 p.m., taking a short break at Domino's en route, before reaching the **Airbus manufacturing facility**.

Upon arrival, the group was assigned a special technical mentor, **Mr. Rahyno**, who provided an introductory briefing on Airbus and its global operations. The industrial visit began with an overview of the various divisions within the facility, focusing on the **A320 Family of Aircraft**.

Sections Visited:

1. **Pre-Fabrication Division** – Manufacturing and assembling fuselage sections (shells) before integration.
2. **Internal Installation** – Electrical systems and internal fittings installed after prefabrication of the central structure.
3. **Final Assembly** – As Airbus manufactures aircraft components at multiple facilities worldwide, parts from **France, USA, China, and Belarus** are transported to Hamburg for final assembly.

4. **Final Inspection & Testing** – Completed aircraft undergo internal inspection and third-party verification before delivery.
5. **Paint Division** – Aircraft painted according to the specific branding and requirements of the airline customer.
6. **Product Delivery Office** – Final handover to the client after signing trade documents, approvals, and a successful flight test.

The students also learned about various **A220** and **Neo Series** models, along with the unique **Beluga aircraft**—a remarkable example of aviation engineering designed for transporting oversized components.



Day	Date	Activities
Day 25	04/08/2025 (Monday)	<p>Official Institute Visit – Warsaw University of Technology</p> <p>The official visit commenced on 03/08/2025 at 11:30 p.m. via FlixBus, arriving in Warsaw at 8:00 a.m. the following morning. After a short walking tour of Warsaw's Old Town, we reached the Warsaw University of Technology at 11:30 a.m. and visited the International Cooperation Department.</p> <p>A meeting was scheduled at 1:00 p.m. with the Director of the International Cooperation Department, during which the following topics were discussed:</p> <ul style="list-style-type: none"> • Discussion on Signing a MoU for the IEP program and exploring possibilities within various disciplines. • Research collaboration opportunities for faculty members. • Admission criteria for master's programs. • Overview of GTU, including its functioning, curriculum, achievements, and organizational structure. <p>The discussion lasted for approximately 45 minutes and concluded with the presenting of a token of appreciation from GTU. We both decided to remain in contact, with further communication planned towards the end of September 2025 through email after their summer vacation.</p>





Presenting a token of appreciation to Director Grzegorz Robak, International Cooperation, Warsaw University of Technology.

Day 26 05/08/2025
(Tuesday)

Tour plan to visit local castle of Szczecin, philharmonia and National Museum of Szczecin.

Day 27 06/08/2025
(Wednesday)

Technical Tour in Collaboration with the Maritime University of Szczecin

A technical tour was organized by Prof. Norbert in collaboration with the Maritime University of Szczecin. The visit included an inspection of the university's training ship, with the Dean of the university kindly providing access to excellent technical facilities, enabling a detailed exploration of various areas of the vessel and its operations.

The tour covered:

- Deck area
- Navigation chamber
- Captain's chamber
- Engine room
- Anchor system

During the visit, participants gained an understanding of key maritime technical terminology, including concepts such as *seaside*, *starboard side*, and *beaching*.

The tour also highlighted the potential career and application areas for mechanical engineers in the maritime sector, particularly in the ship's engine room, maintenance activities, as well as piping and pressure systems.



Ship Engine room

Dinner Invitation and Program Certificate Distribution

At 2:00 p.m., Prof. Norbert and Prof. Malgorzata invited all participants for a dinner at *Nepali Chulo Restaurant*, located on Księcia Bogusława Street, Szczecin, Poland.

Before the meal, both professors shared their experiences with the IEP_2025 batch. They expressed their appreciation for the group of eight students, highlighting their punctuality in attending classes, discipline, and overall exemplary behavior.

On the same day, the **IEP_2025 Program Certificates** were officially distributed to the students.

GUJARAT TECH





Best memories after delicious Lunch

Day 28	07/08/2025 (Thursday)	Students get the time to prepare a final Presentation including all Industrial visit of IEP 2025.
Day 29	08/08/2025 (Friday)	Students get the time to prepare a final Presentation including all Industrial visit of IEP 2025.
Day 30	09/08/2025 (Saturday)	Rest day for the students
Day 31	10/08/2025 (Sunday)	Rest day for the students
Day 32	11/08/2025 (Monday)	Concluding the International Experience Program 2025, Pack up for return journey



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| Day 33 | 12/08/2025
(Tuesday) | Travel towards berlin from Szczecin, Poland, for scheduled flight from Berlin to Doha. |
| Day 35 | 13/08/2025
(Wednesday) | Doha Airport |
| Day 36 | 14/08/2025
(Thursday) | Arrived at Sardar Patel International Airport, Ahmedabad.
After meeting with all the parents officially IEP 2025 program declared ended. |



Submitted by:

Kedar H Badheka
Assistant Professor, GTU-ITR
IEP- 2025, Mentor: University of Szczecin Poland
(Mechanical Engineering)