JCCU Industrial Tour 2025 to the Czech Republic – Tour Report

by tour organiser Gibran Ahmed, St Edmund Hall

In March 2025, a group of undergraduate students from the Department of Materials, University of Oxford, together with an accompanying tutor, travelled to the Czech Republic for the annual JCCU Industrial Tour. The tour was based primarily in Brno and Prague, two major industrial and cultural centres, and aimed to expose students to the application of materials science across aerospace, advanced manufacturing, microscopy, and superconducting technologies.

The organiser and participants would like to extend their sincere thanks to the Department of Materials and the Worshipful Company of Armourers and Brasiers for their generous sponsorship, without which the tour would not have been possible. The organiser would also like to thank departmental staff, especially James Marrow, for their guidance through the administrative and logistical requirements of organising an overseas industrial tour, and the accompanying tutor, Barbara Gabrys, for their academic and pastoral support throughout the week.

The group made visits to the following companies and institutions:

1. PBS Velká Bíteš (Investment Casting and Aerospace Components)
2. SAB Aerospace
3. Aircraft Industries
4. TESCAN
5. CAN Superconductors

Monday 24th March

The group departed London Stansted Airport in the afternoon, arriving at Brno–Tuřany Airport in the early evening. After airport transfer, the group checked into the hotel in Brno, where students were given time to unpack and settle in. This first evening was intentionally kept light, allowing the group to rest ahead of the busy schedule of upcoming industrial visits.

Tuesday 25th March

The first industrial visit of the tour took place in the morning at PBS Velká Bíteš, a company renowned for its high-precision manufacturing capabilities across aviation, investment casting, cryogenics, and energy-related applications. Students were introduced to the company's vertically integrated production model, with a strong emphasis on materials selection, processing routes, and quality control in safety-critical components. The visit focused on their investment casting division and highlighted the importance of precision manufacturing and in-house research and development in maintaining competitiveness in high-tech industries.

The afternoon was left free for students to explore Brno independently, offering an opportunity to reflect on the visit and experience the city's cultural and historical environment.

Wednesday 26th March

On Wednesday morning, the group visited SAB Aerospace, a company specialising in the design, testing, and manufacture of space systems and satellite technologies. The visit provided insight into how materials considerations underpin spacecraft design, from structural components to thermal management and reliability under extreme operating conditions. Students gained an appreciation of the full lifecycle of space hardware, from concept and requirements definition through to qualification and launch readiness. The visit also gave insight into the culture of close industry-university ties in Czech technology, with SAB being on the BUT science park site.

In the afternoon, the group travelled to Aircraft Industries, the Czech Republic's sole manufacturer of transport aircraft. The company is best known for the L-410 aircraft and its long history in aerospace manufacturing. Students were shown aspects of aircraft production, materials choices for airframes, and ongoing research and development efforts to improve performance, durability, and efficiency. The visit also highlighted Aircraft Industries' role in education through its affiliated aviation high school, demonstrating a strong link between industry and skills development.

Thursday 27th March

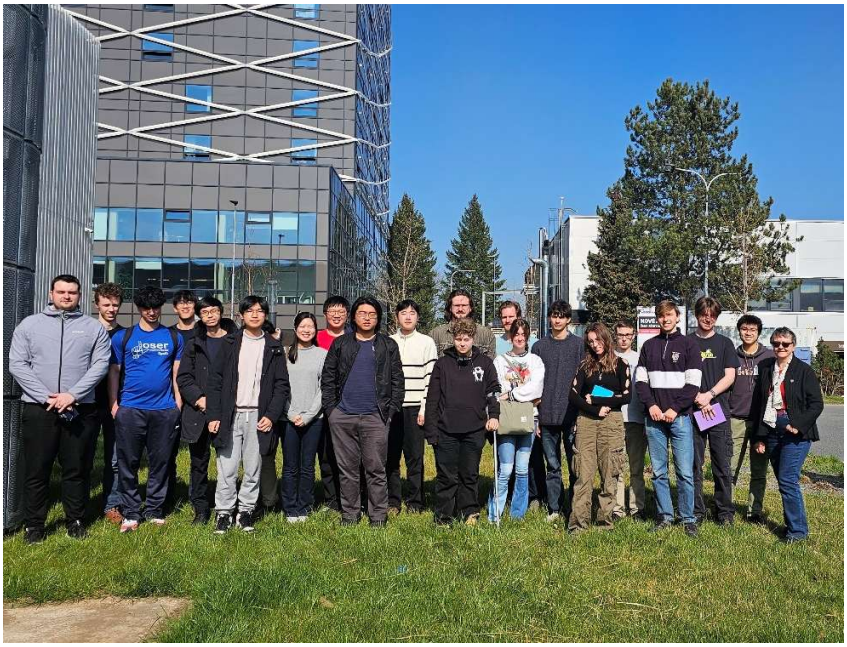
Thursday's visit was to TESCAN, a world-leading manufacturer of electron microscopy and microanalysis equipment, including SEM, FIB-SEM, STEM, and micro-CT systems.

Students learned about the historical development of electron microscopy in Brno and TESCAN's evolution from its origins within the former Tesla company. The visit focused on both the physics underpinning advanced microscopy techniques and the engineering

challenges involved in producing high-performance, reliable instruments at scale. Students were given a tour of TESCANs entire manufacture facility where components arrive from subsidiaries and partners to be assembled and calibrated before being shipped to customers. This visit closely coincided with students' academic studies in characterisation techniques.

The afternoon was kept free, allowing students time to explore Brno further and prepare for the second half of the tour in Prague.

Friday 28th March



The group travelled from Brno to Prague, stopping en route to visit CAN Superconductors. CAN is a Czech manufacturer specialising in the research, development, and production of bulk superconducting materials, including REBCO and Bi-2223 systems. The visit offered students exposure to cutting-edge superconducting materials and their applications in aerospace, medical technology, and high-field magnet systems. Discussions with staff highlighted the company's strong links to academic research and its international customer base, including major aerospace and scientific organisations.

Following the visit, the group continued on to Prague, checked into the hotel, and had the remainder of the day free to explore the city.

Saturday 29th March

Saturday was designated as a free day in Prague. Students explored the city at their own pace, visiting cultural and historical landmarks such as Prague Castle, museums, and galleries, or simply enjoying the city's architecture and atmosphere. In the evening, the group reconvened for a final group dinner, providing an opportunity to reflect collectively on the technical visits and the overall experience of the tour.

Sunday 30th March

On the final day, the group checked out of the hotel and transferred to Prague Václav Havel Airport for the return flight to London Heathrow. The journey marked the conclusion of a successful industrial tour that combined technical depth, exposure to diverse industrial sectors, and valuable cultural experience.

Conclusion

The 2025 JCCU Industrial Tour to the Czech Republic provided students with a broad insight of how materials science is applied across multiple high-impact industries, from aerospace and space technology to advanced characterisation and superconductivity. The tour gave academic learning with real-world industrial context and international perspective, exposing students to potential future areas of interest in materials industry. Feedback from participants was overwhelmingly positive, and the tour successfully fulfilled its educational and industrial engagement objectives.