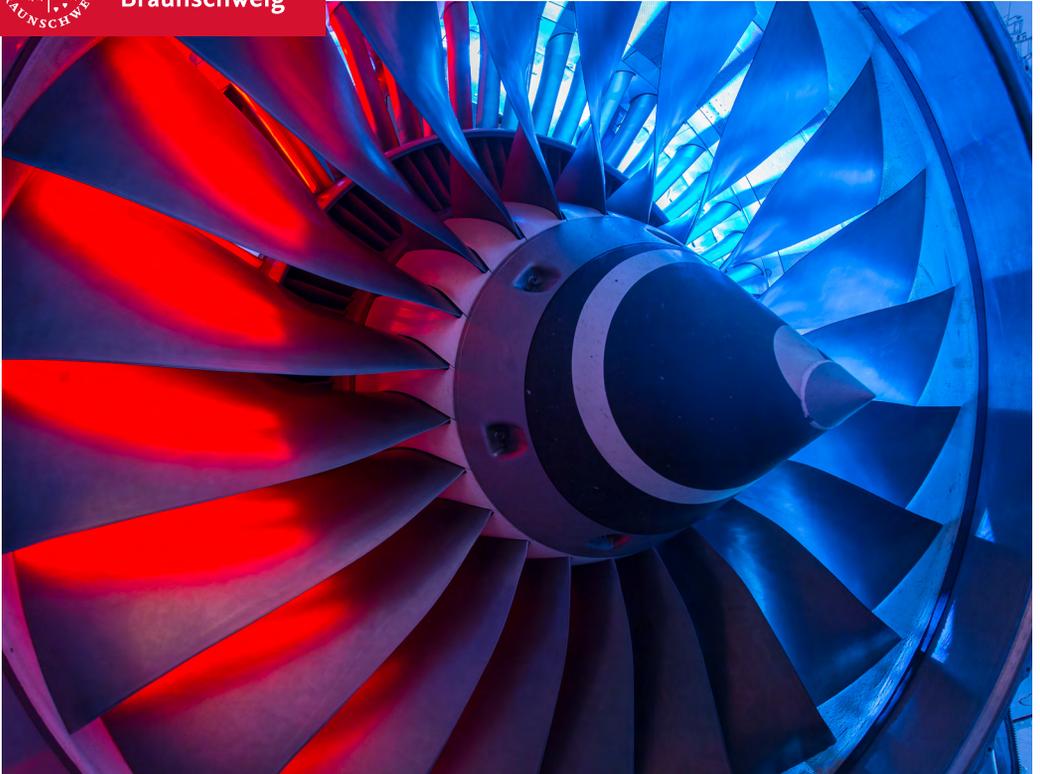




Technische
Universität
Braunschweig



TU BRAUNSCHWEIG
summer school



Summer School 2025

International Summer School:
Advanced Sustainable Aviation Technologies

Key facts

| | |
|-------------------------|---|
| Time period | 01–12 September 2025 |
| Registration deadline | 15 August 2025 |
| Event form | Online (01–05 September) and on site (08–12 September) |
| Participation fee | Free of charge |
| Language of instruction | English (on the level B2/C1) |
| Workload | 90 hours, divided into virtual and on-site phases |
| Credits | 3 ECTS credits |
| Certificate | Graded certificate |
| Target group | Master students of any discipline with a strong interest in sustainable aviation technologies |

Any questions?

Please do not hesitate to contact us, we are happy to help!

Joana Zimmer

+49 531 391 14339

summerschool@tu-braunschweig.de

Course overview

Please note that this preliminary course overview may be subject to change on short notice.

| | Online part | | | | | On-site part at TU Braunschweig | | | | |
|-------------|---------------------------|---|--|--|--------------------------------|------------------------------------|--|------------------------------------|------------------------------------|--------------------------------|
| | Mon, 01 Sep | Tue, 02 Sep | Wed, 03 Sep | Thu, 04 Sep | Fri, 05 Sep | Mon, 08 Sep | Tue, 09 Sep | Wed, 10 Sep | Thu, 11 Sep | Fri, 12 Sep |
| 08:30–10:00 | Introduction | Materials and Structures | Emissions and climate aspects | Operational Considerations for Aircraft Engine MRO | Lifecycle Assessment | Welcome | Electrical Systems | tba | Group work with expert consultants | Project Presentation (Group 1) |
| 10:00–10:30 | Coffee Break | | | | | Coffee Break | | | | |
| 10:30–12:00 | Energy Supply - H2 | Advanced Systems Engineering | Combustion Fundamentals for Sustainable Aviation | Noise Prediction and Assessment | Power Electronics for Aviation | Group Work with Expert Consultants | | | | Project Presentation (Group 2) |
| 12:00–13:00 | Lunch Break | | | | | Lunch Break | | | | |
| 13:00–14:30 | Aircraft Aerodynamics | Airline Operations Research | Combustion Emissions | Sustainable Air Traffic Management | Overall Aircraft Requirements | Group Work with Expert Consultants | Visit to Hannover Airport | Group Work with Expert Consultants | Project Presentation (Group 3) | |
| 14:30–14:45 | Coffee Break | | | | | Coffee Break | | Coffee Break | | |
| 14:45–16:15 | Energy Supply - Batteries | Improving aircraft performance through flow control | Flight Control | Fuel cells for Aviation | Online Quiz | Braunschweig City Tour | Aerospace Lab Tour - TU Braunschweig: IFAS, ISM, IFL | Group Work with Expert Consultants | Closing Ceremony | |
| 16:15–16:45 | Break | | | | | | | Break | | |
| 16:45–18:15 | Virtual Campfire | | | Q&A | | | | Barbecue | | |

Modules and projects

Lecture modules (online preparation phase and on-site morning sessions)

- » Advanced Aircraft Performance/Design
- » Advanced Propulsion Systems (BLI, UBHR, Open Rotor, Distributed Propulsion)
- » Air Traffic Management & Operations Research
- » Advanced Design Methods (MDO, Digital Twin)
- » Future Aviation Fuels and Energy Carrier – Advantages, Disadvantages and Risks
- » “The Airline Perspective” (Fleet Planning and Operation)
- » Other Disciplines (e.g. Life-Cycle Assessment, Climate Modelling)

Project work (defining problems with industry partners)

- » Definition of Top-Level Requirements and Basic Mission Description for a Future “Low-Emission-Aircraft”
- » First Preliminary Design of Aircraft
- » First Preliminary Design of Propulsion System
- » Assessment and Discussion of Pros and Cons
- » Aspects of Integration into the Global Aviation Systems

Project ideas (4–5 students per group estimated)

- » Sustainable Aviation Solutions for Reg./Short Range
- » Sustainable Aviation Solutions for Medium Range
- » Sustainable Aviation Solutions for Long Range



Photo: Kristina Rottig/TU Braunschweig



Photos: Sebastian Olschewski/TU Braunschweig; Walter Bergmoser/TU Braunschweig

The world is facing an enormous challenge in transferring aviation into a more sustainable and greener transport mode.

In the long run, sustainable and emission-free flights over the entire aviation sector from short range to long range operation are the current priority and require enormous research and

development activities which can by no means be limited to classical aerospace disciplines. Instead, they require new interdisciplinary approaches, methods and teams covering all aspects from aerospace, from materials to structures, from energy to propulsion as well as aircraft design, electrical engineering and even economic and social sciences.

Of course, this all starts with an up to date insight in the most current state of the art in aviation. In our Summer School course, you can acquire both theoretical knowledge and practical project experience in the field

to address these grand challenges, and to connect with fellow students from different countries.

The programme is divided into two parts: The basic knowledge about methods and technologies will be given in lectures held by professors from TU Braunschweig and our partner universities as well as from aviation industry experts during the virtual phase. Afterwards, you will put your knowledge into practice. The on-site phase will consist of additional lectures in Braunschweig to gain specific insights and well as a hands-on

project that will be conducted in international and interdisciplinary teams, supervised by professors. The Summer School will be complemented by a rich social programme: There will already be some joint online evening events to exchange ideas during the online phase. During the on-site phase, participants will spend the afternoons taking part in activities in Braunschweig. You will get to know the city, the university's research airport as well as one of TU Braunschweig's research facilities. You will also have enough time to explore the city on your own and to get to know your fellow students.

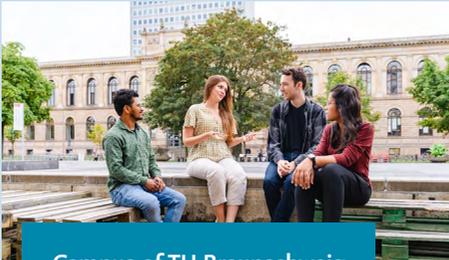
Impressions of our Summer Schools



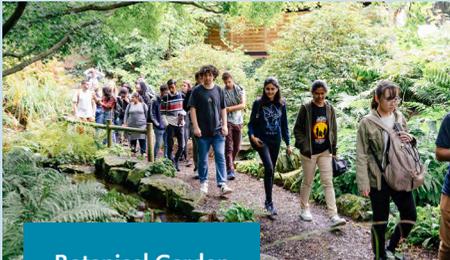
Visits to institutes



Braunschweig's historic centre



Campus of TU Braunschweig



Botanical Garden



Free-time activities



Research Airport

Photos: Lasse Ebbecke/TU Braunschweig; Simone Fürst/TU Braunschweig; Christopher Vehrke/TU Braunschweig

Application

Please apply until **15 August 2025**. Registration may be closed before the deadline in case the maximum of participants is reached.

Please use the application form that you can find on our website:

→ www.tu-braunschweig.de/summer-school

After filling out the form, please send it to us via email:

✉ summerschool@tu-braunschweig.de



Photo:
Stephan Nachtigall/TU Braunschweig