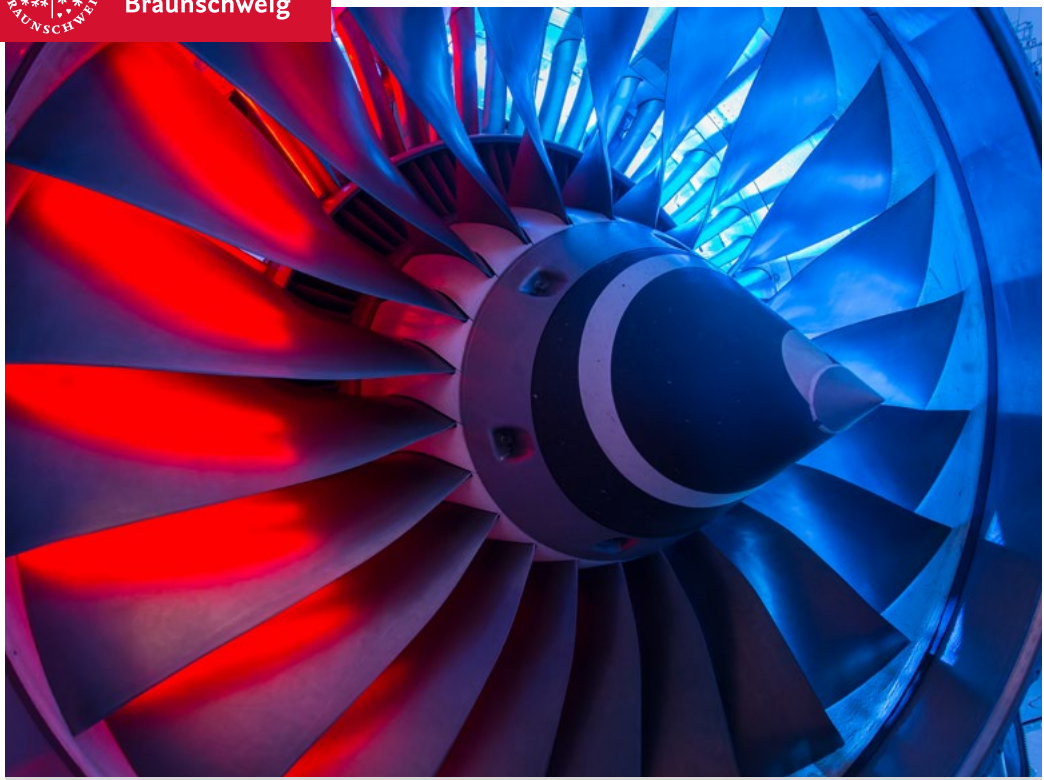
Technische Universität Braunschweig

TU BRAUNSCHWEIG
summer school



Summer School 2024

Summer School for Advanced Sustainable Aviation Technologies

Photo: Sebastian Olschweski/TU Braunschweig

Key facts

Time period	02–13 September 2024
Registration deadline	15 July 2024
Event form	Online (02–06 September) and on site (09–13 September)
Participation fee	Free of charge
Registration fee	approx. 363 € (for enrolling as an exchange student)[1]
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, preferably students of TU Braunschweig and its partner universities

[1] The fee covers reduced prices for food in the cafeterias, reduced prices for museums, cinemas, and similar local culture as well as sport offers, and includes free travel in all local trains and public transport in all of Lower Saxony. You need to enrol as an exchange student at our university to have access to all university services. However, enrolling is not necessary to participate in the Summer School programme.

Any questions?

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

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Course overview

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

	Online part (via WebEx)					On-site part (at TU Braunschweig)				
	Mon, 02 Sep	Tue, 03 Sep	Wed, 04 Sep	Thu, 05 Sep	Fri, 06 Sep	Mon, 09 Sep	Tue, 10 Sep	Wed, 11 Sep	Thu, 12 Sep	Fri, 13 Sep
08:30–10:00	Advanced Propulsion Systems	Materials and Structures	Noise Prediction and Assesment	Energy Supply (Batteries)	Fuel Cells for Aviation	Overall Aircraft Requirements (Airbus)	Electrical Systems (RRD)	Aviation and Clima – Legal Aspects (DG Clima)	Certification Aspects (EASA)	Project Presentation (Group 1)
10:00–10:30	Coffee Break					Coffee Break				
10:30–12:00	Electric Propulsions Machines	Aircraft Aerodynamics	Air Traffic Management	Energy Supply (H2)	Emissions and climate aspects	Group Work with Expert Consultants (from SE²A Cluster of Excellence)				Project Presentation (Group 2)
12:00–13:00	Lunch Break					Lunch Break				
13:00–14:30	Advanced Aircraft Design	Flight Control	Power Electronics for Aviation	Energy Supply (SAF)	Airlines Perpectives	Group Work with Expert Consultants (from SE²A Cluster of Excellence)				Project Presentation (Group 3)
14:30–14:45	Coffee Break					Coffee Break				
14:45–16:15	Airline Operations Research	Active Load Control	Regulatory Frameworks	Lifecycle Assessment	Online Quiz	Guided City Tour through Braunschweig	Group Work with Expert Consultants	Visit to the Research Airport	Group Work with Expert Consultants	Closing Ceremony
16:15–16:45	Break						Break		Break	
16:45–18:15	Virtual Campfire			Q&A			Aerospace Lab Tour		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

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 the partner universities TU Delft and Tampere University 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.

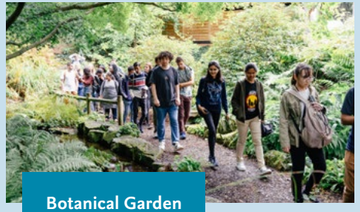
Photos: Sebastian Olschweski/TU Braunschweig; Walter Bergmoser/TU Braunschweig

Impressions of our Summer Schools

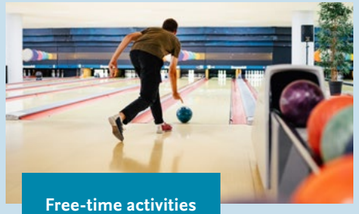
Visits to institutes

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 July 2024. 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